



Managing complexity (and chaos) in times of crisis

A field guide for decision makers inspired by the Cynefin framework

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Abstract

This field guide helps to navigate in times of crisis using the Cynefin framework (page 58) as a compass.

It proposes a four-stage approach through which we can:

- assess the type of crisis and initiate a response;
- adapt to the new pace and start building sensing networks to inform decisions;
- repurpose existing structures and working methods to generate radical innovation;
- transcend the crisis, formalise lessons learnt and increase resilience.

The guide stresses the importance of setting and managing boundaries, building informal structures, keeping options open, distributing engagement and keeping an ongoing assessment of the evolving landscape. Action items, real life examples and demonstrations complement the references to the developing theoretical framework.

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Anne Caspari, Cynefin Centre; **Beth Smith**, Cynefin Centre; **Eleanor Snowden**, Cynefin Centre; **Vera Winthagen**, Joint Research Centre, European Commission.

In the course of producing this guide we benefited from early review of the structure and content from a wide range of people from four continents who had experience in the use of the Cynefin Framework.

We would like to acknowledge their contributions:

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University of Hull, Stellenbosch University

Professor, complexity practitioner

Creator of the Cynefin framework

The Cynefin framework grew out of my starting to develop the field of naturalising sense-making.

The naturalising element links to the need to use natural science in understanding how humans interact with systems and with each other.

Sense-making is defined as how do I make sense of the world so that I can act in it. For practice to be informed by good science is critical in the growing turbulence of the world we live in and I hope that the framework, and this book make some small contribution to that goal.

Alessandro Rancati

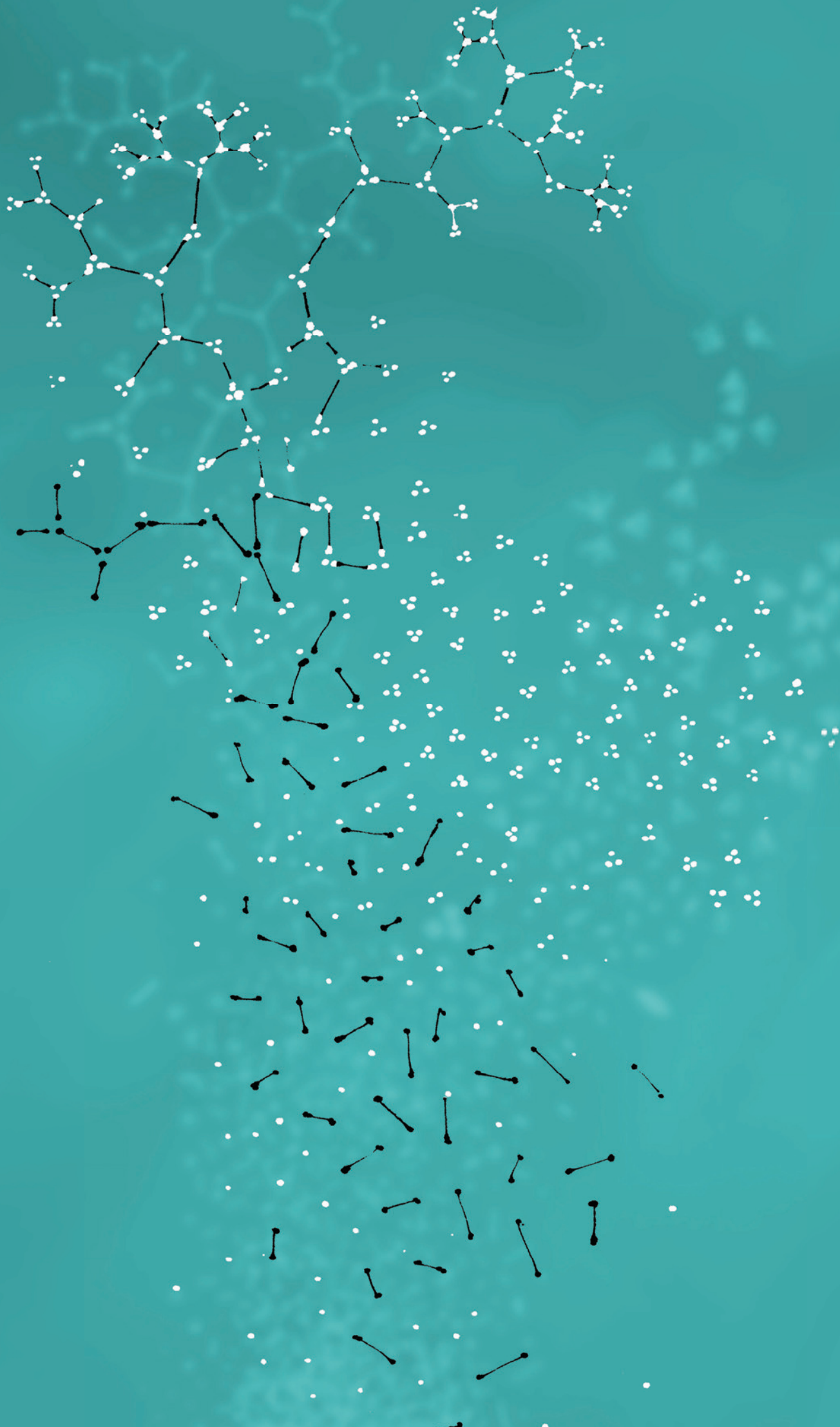
Joint Research Centre, European Commission

Architect, designer

The Cynefin framework made me realise how design, in what I consider its most valuable expression, ritually creates moments of crisis, tapping into chaos to propose profound paradigmatic changes. In this book we make reference to the role of design and design practices in mapping crisis and in moving out of uncertainty. We suggest how synthesizing our experiences within crisis into visual landscapes is a precondition to start coherent action. In the illustrations, I tried to express how sometimes crisis transforms our most solid structures into beautiful new entities.

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Foreword

More often than not, what works in normal times won't work in a crisis. We need to think and act differently. This field guide provides a framework to help decision-makers to do this. Inspired by the Cynefin framework, it describes methods and practices that can help decision-makers to navigate complexity and chaos, respond effectively to crisis, and deepen organisational resilience.

I first encountered Dave Snowden and his work on the Cynefin framework at an internal European Commission training event in early 2010. Dave's presentation was both inspiring and challenging. Inspiring because full of fresh ideas and provocations for my established way of seeing things. Challenging, because my initial conclusion was: this sounds great, but how to do it? I had difficulty seeing how I could make use of these ideas and concepts in the "normality" of public administration.

In the subsequent months and years, I spent quite some time listening to Dave's podcasts, reading his blog and trying to feel my way towards making good use of these concepts in my job. It seemed obvious to me that I should, yet I struggled to work out how. I went on an Cynefin training course, to try to get a better understanding of the concepts, and I increasingly found myself using elements of Cynefin language to frame my decision-making. For example, I found that asking whether this was a simple, a complicated or a complex problem helped me to categorise

things and adapt my responses accordingly. But I remained conscious that this was a very superficial use of a far more sophisticated toolkit.

When I was asked to lead the Commission's IT Department in 2013, I reached out to Dave and got one step further forward, running an internal pilot using Cynefin techniques to map customer stories in relation to IT. The stories we captured were relevant and did help us to shape the strategy to improve customer solutions, yet we did not embed this more deeply into our way of doing things. Dave also came to speak at our annual IT conference in 2013 and got very positive responses, but overall my efforts to help "spread the word" remained an interesting side project.

In 2016 I moved again, to run tax and customs, and my personal Cynefin path went a bit cold. I was still using the language to guide my thinking, but not in an integrated way. During this period I did, however, have the opportunity to start working with Alessandro Rancati in the Joint Research Centre's EU Policy Lab, using design methods to map out my vision for the future development of the department. Serendipitously, when I was asked to take on the leadership of the Joint Research Centre in early 2020, this connection created the path to reconnect with Cynefin. I arrived as the pandemic was raging, and one of the very first conversations I had was with Alessandro and Dave, who were already

working together on this field guide.

One of the positive effects of the crisis is that it has forced policy makers to "think anew". It has forced us to understand that we need to adopt more robust responses to managing complexity in times of crisis. And, I hope, it has helped to create the conditions for a broader understanding and uptake of the usefulness of frameworks such as Cynefin in making sense of things. I wish I had had such a guide back in 2010, and I am delighted that it now exists.

In the Joint Research Centre, we will continue to explore how we can best make use of this framework to support policy design and delivery in the European Commission. The COVID pandemic has demonstrated that we need to find new and better ways of acting and reacting. This field guide offers important, powerful and practical tips on how. I believe that if decision-makers are able to embed the practices and methods set out in this field guide in their organisations, it will enhance resilience and the ability to respond effectively to future crises. Not only will the starting point be better next time around – so will the response. I very much hope you find it useful

Stephen Quest

*Director General
European Commission – Joint Research Centre*

crisis level		chaos	chaos
	risks	lack of future preparedness contingency plans are missing old approaches still relevant	normal pace stays in effect weak signals are not spotted or ignored
	likely state of mind	surprised, overwhelmed	puzzled
	ideal disposition	reflective verify if the situation is novel and if contingency plans exist. Start journaling.	empowering centralise coherence (not decisions!), coordinate interventions, delegate decisions, ensure divergent contributions.
		draconian set clear boundaries to gain time to think.	transparent communicate by engagement, map dispositions.
	actions	set draconian constraints Constraints are not bad per se; without them there would be no evolution. Constraints are a key enabler of creativity. Set unquestionable constraints early to gain time.	manage constraints Monitor dispositions and manage constraints to detect beneficial behavioural patterns.
		start a journal Journaling creates precious learning material across the entire crisis. Start early and sketch as much as possible. Visual journaling provides thick data, synthesises more information in a smaller space and allows for both quick scanning and detailed recall.	reduce granularity Fragment information, capture rich data. Increase communication and awareness: embrace repetition, be as transparent as the situation allows with a bias towards overtransparency.
		activate human sensor networks Ask cognitively, culturally and experientially diverse groups of people to assess the situation independently of each other without the chance of cross connection.	create specialised crews We can't afford for everyone to be involved in everything (it wasn't a good idea even in normal times). Old forms of consensus are going to have to go out of the window fast.
			distribute engagement We need distributed sensor networks and fast feedback loops to detect and manage weak signals.

[<>]

Exapt

Transcend

pivot

emergent stability

stability

over-commitment, too early on

centralised decisions
rigid structures
long term cycles

late stocktaking
biased stocktaking

reactive

resolute

confident

aporetic

focus on making sense of all inputs,
build coherence, spot opportunities,
challenges and dispositions.

radical

open to radically repurpose existing
processes and tools.

systematic

formalising experiences and lessons
learnt.

explorative

open to set up parallel coherent
experiments to address key issues.

landscapes from experiences

Narratives give insights on the
disposition of an organisation. They also
identify agents, drivers of change,
explicit and hidden boundaries, informal
processes, challenges and opportunities.

repurpose

The most efficient way to address crisis
is through exaptation, or radical
repurposing of available assets.

manage cadence and control

At this point we should have several
units operating in ways that are novel
for the organisation: maintain cadence
and control. If we lose coherence, we
may quickly spiral back into chaos.

discover opportunities

The response to a challenge varies
depending on its nature and on its
context. Lack of time, resources or
knowledge may turn a clear decision
into chaos.

extreme repurposing

Unexpected events brought us
unintentionally into chaotic processes
that can have catastrophic
consequences on us and on our context.

ritualise learning

We learn more from failures than
success, and the learnings are more
reliable if the lessons are recorded and
formalised when they are still fresh.

design radical innovation

Enter deliberately into chaos by
removing conceptual boundaries and
fixations; push the envelope, explore
unreasonable ideas. Reframe the
problem space, challenge the norm.

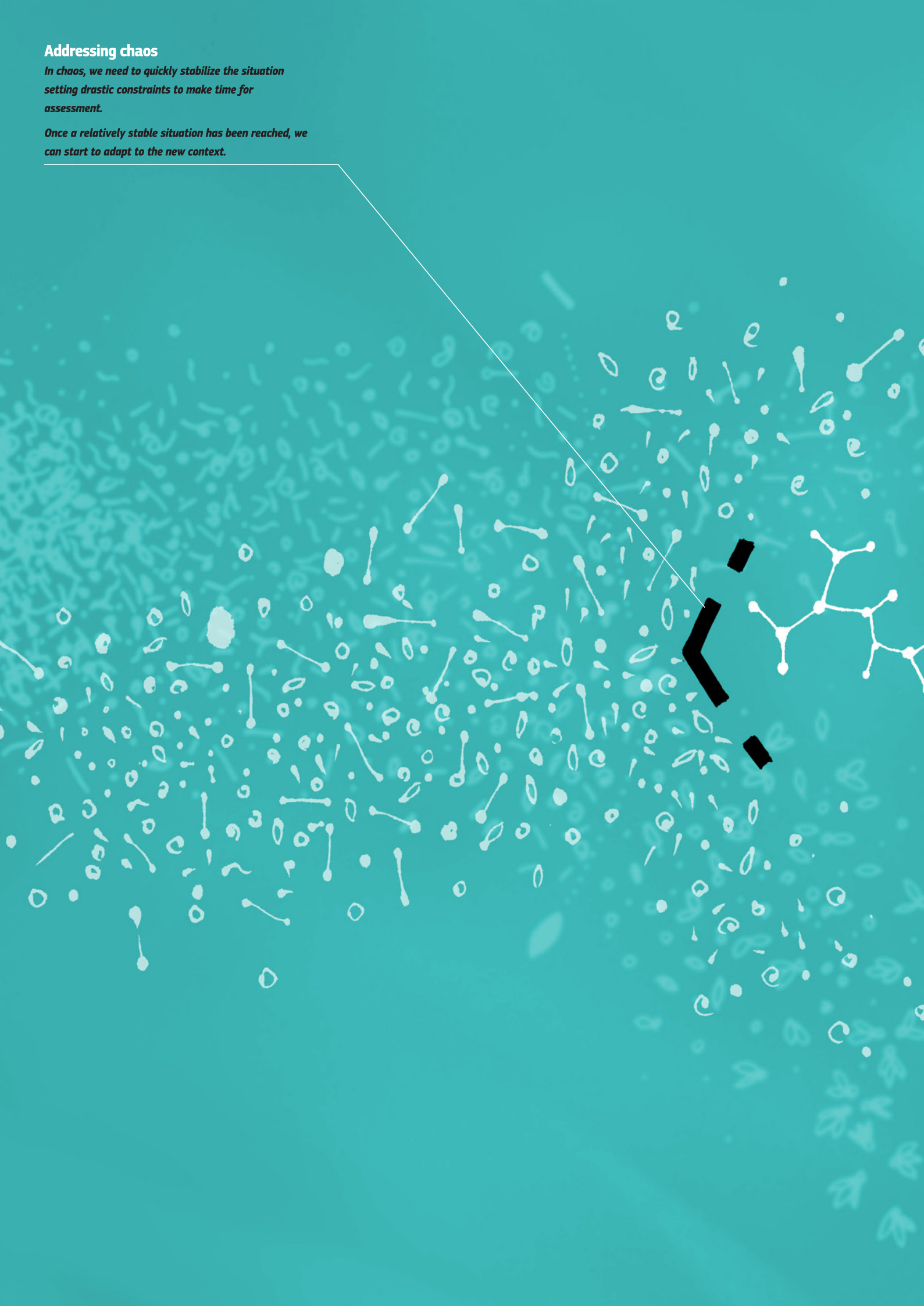
design strategic interventions

Challenge the interactions between
agents to inform strategic decisions. It
is more effective than pre-determining
an objective.

Addressing chaos

*In chaos, we need to quickly stabilize the situation
setting drastic constraints to make time for
assessment.*

*Once a relatively stable situation has been reached, we
can start to adapt to the new context.*



Assess

In times of crisis our context changes to the point of creating an emotional or cognitive shock and a state of confusion.

Set draconian constraints: The first immediate action is to create hard boundaries that allow us to gain time while observing and mapping what is coming at us, to identify what response strategies need to be adopted.

Check for contingency plans: If the situation was foreseen or expected and there are contingency plans, then we address the crisis according to plan.

Start assessing: If the situation caught us unprepared, we need to quickly create small, informal groups that will dive into chaos to understand how the crisis changed the landscape.

The first and most fundamental question in crisis is: are we ready for this? In other words:

- **was it possible or plausible** for us that this event could happen?
- **do we have contingency plans** in place for this crisis and are we sure we are correctly assessing it?

If the answer to both is YES!

Then we can implement our planned process.

If the response was unknowable in advance but, after an initial assessment, decisions are clear, then our system is resilient, has a degree of redundancy and will allow us to address the crisis.

Still, we need to pay attention to two aspects that can have major consequences.

We need to **constantly monitor for outliers** that question whether our initial assessment might be wrong. We also need to **create clear boundaries around the start and end of the crisis**. Avoiding drift is key and ritualising boundary transitions is important.

If the answer to either is NO!

Then we are in a far more serious situation and planned processes and old ways of working have to be treated with care. We urgently need to initiate a radical change in the way we work, we need to adapt very quickly to changed circumstances.

Most organisations have learnt to plan for unexpected threats and surprises, the now notorious *black swan* events. Contingency and scenario planning, cone of possibilities and many other techniques have emerged over the years. But every now and then something comes along which falls outside the range of our planning and creates a level of shock that we find difficult to manage.

Chaos and catastrophe by their very definition do not repeat but it is important to realise that there are different types and levels of uncertainty that we need to be aware of. It is not always about being rational or having a process in place: being aware of our limits in what we are able to see and comprehend as possibilities is as important as planning. Indeed, in some contexts, planning may make us more vulnerable than improvising, as it exposes us to inattentional bias.

Inattentional bias

In making a decision it is in human nature to quickly carry out a partial data scan and then filter it through multiple fragmented memories for a 'first fit' (vs. a 'best fit') pattern match. This makes us see first what we remember or what we expect. This limitation is a part of what, as decision

Inattentional bias and the 17%

24 radiologists were asked to perform a familiar lung nodule detection in a set of radiographies.

A picture of a gorilla, 48 times larger than the average nodule, was inserted in the last case, but 83% of radiologists did not see it. Eye-tracking showed that the majority of the those who missed the gorilla looked directly at it.

The 17% who had seen the gorilla changed their minds after talking to the 83%. In crisis it is important to identify the 17% in our organization and let them share what they see before they are influenced by the 83%.

	unknowable	knowable	known
feasible it will happen	design for resilience & redundancy	rapid response and deployment	planned response
plausible but unlikely	serendipity	rapid repurposing	contingency planning
unimaginable but possible	sacrifice	seize the day	reality strikes back

Figure 1. Comprehension and decision

makers, we need to work with.

Our ability to comprehend ranges from the totally expected, where (like a squirrel) we can marshal and prepare resources for hard times, to a combination of the unexpected black swans with the elephant in the room. The recent COVID-19 crisis and climate change being two good examples of this.

In these cases inattention comes from our feeling of being unable to do something: we ignore the issue in the hope that it might pass.

Our ability to respond is a question for knowledge management. It ranges from known through knowable to unknowable. At one extreme we are fully aware that something can happen and have a more or less automatic process which comes into play when the trigger event occurs. At the other extreme we are faced with something that we simply couldn't comprehend and we have no idea or process able to handle it. We have to accept that some major sacrifice or sacrifices will be needed to survive, if survival is possible. A key part of our planning is to recognise these differences and reflect them in our strategy. The green areas in the diagram are those for which conventional planning is possible, the orange (and in large part the white) require to both think and act in radically different ways. Once we have established that the current situation was either not considered plausible, was unimaginable or we have no plans and little idea of what to do, we need to again double check and really be sure, as from now on our entire focus is going to be on how to rethink our organisational structure in terms of disentanglement.

Disentanglement

During moments of stability, when bureaucracy and conservative interests tend to grow in importance, organisations evolve

into a deeply entangled complex system, like bramble bushes in a thicket or the root system of a mangrove swamp. In a crisis, much of this entanglement can and should be surrendered to the moment. There is a real chance to **sense, see and actuate new forms of simplicity** to increase the overall agility and resilience of the organisation.

Chaos places us in a very fluid context: first we have to gain some form of control, then we need to empower informal networks through light organisational structures. Resources need to be radically and, possibly, permanently reallocated. Life is not going to be the same again, even if we escape unscathed from the situation. We can't predict outcomes, so we need to shift and move at speed and be open to new possibilities on the journey; manage the risk as well as the possibilities.

The only thing we know for certain is that there will be unintended consequences: we must be prepared for those too.

Immediate priorities

We start by **setting constraints**, and this may need an authoritarian act to keep options open as long as possible. This approach is likely to be accepted in the early days of crisis, but less so as things progress. By creating constraints we gain some control over a chaotic environment and give ourselves time to shift gears for the organisation as a whole.

Constraints must be providing enough structure while staying flexible enough to let people react and adapt to the new context. Too rigid constraints will only resist for a short time and will break catastrophically.

It is then critical to **identify any immediate short term action** which will hold as many options open for the future as possible.

We might be tempted to seek evidence that points us to "the" right thing to do, however, in a

crisis situations unravel rapidly, and we need to practice the delicate dance between seeking confirmation and taking decisive action. We have to demonstrate action, whilst maintaining space for the emergence for as yet unknowable changes.

After this initial set of decisions, the modus operandi changes. From now on the essence of 'command' is to **co-ordinate while delegating decision making**. We keep an eye on managing the bigger picture and reserve energy to scan across a wider range of activities.

The sheer volume of decisions demand the need for intimate knowledge of local context. Leadership needs to assume the role of a grand conductor - coordinating and creating space for local experts to make decisions for their contextual needs. The organisation has the opportunity to enter in a co-design mode, with the intent of questioning its scope and re-designing its practices in a collaborative way. A further argument in support of suspending top-down decisions is the cost of un-doing. When we over-commit, we reduce our ability to change course if the situation evolves exposing unexpected threats.

We need to keep options open as long as possible and **avoid premature convergence**. A human sensor network increases the resilience of decisions and responses. If our employees are part of it, and they should, then the network will serve a double purpose, as our engaging them as a support for decisions will also give reasons for deeper motivation and engagement. This is how we **communicate through engagement**, pull as well as push.

Assess in chaos

Set draconian constraints

Without constraints there would be no evolution. They are also a key enabler of creativity. Set unquestionable constraints early to gain time and increase downstream options:

- no exceptions;
- avoid constraints that are too rigid or last for too long;
- keep communication open and extremely frequent.

Limit chaos by immediately setting draconian constraints.

Several forms of constraints are possible:

connecting or containing, resilient or robust, rigid or flexible, permeable, changing, "dark", etc. Each has advantages and disadvantages: rigid and flexible break catastrophically, permeable clog, changing and dark may not be perceived or respected.

We set constraints by defining and enforcing governance systems, decision making processes, spaces and methods for interaction, physical infrastructures, and by accepting behaviours, rituals, needs, etc.

Set enabling constraints. Two examples are rituals, which allow the creation of informal networks, and heuristics, very simple principles that reduce noise and create a common ground, a sort of pre-conditions for consensus, to allow for quick decision making. A ritual could be to organise a daily breakfast with all members of a unit to foster the spontaneous exchange of knowledge. It is crucial to seek the exchange of knowledge as an **indirect** result of rituals. In our example, it would be an error to set "thematic" breakfasts with the explicit purpose of collecting

knowledge. This "rigid thematic boundary" would either fail quickly or require too much energy to be kept alive.

Examples of heuristics are very common in nature. For example, the set of principles that govern the flight of a flock (and unregulated or pedestrian traffic): match speed, avoid collision, move to the centre. They allow individual decision making within shared boundaries.

In organisational terms, heuristics are often recognisable in overarching, informal governance principles.

In more general terms, an enabling constraint has a low level of granularity and fixes either the why or the what or the how, but not the three at the same time. It should also have a certain degree of flexibility to adjust to the changing context.

After setting constraints, we need to **assess if the system is stabilising** and/or if we can start to detect coherent patterns of response. It is essential to maintain communication with stakeholders and personnel.

Setting constraints in COVID-19

COVID-19 demonstrated how good we are at

creating boundaries to gain control.

Confinement is the most evident form of rigid constraint introduced as first response. Limiting personal movement gave relief to overloaded sanitary systems and was the key response to "flatten the curve" or contain transmission. **Closing national borders** is a further example of a rigid, impermeable boundary being set up. Both constraints cannot be enforced indefinitely without an adverse reaction. Some European states introduced **curfew** as a more flexible constraint than total confinement.

Social distancing is the name chosen to describe an increase in minimum physical distance between two persons. This is a form of more flexible, permeable, enabling, "dark" or invisible constraint. It allows people to perform all key vital activities while creating an invisible boundary. The boundary became visible in many places as soon as shops started to mark distances on the pavement outside their business, or on walls.

Masks, gloves and to an extent even **hand sanitizers** can be seen as further physical, (im)permeable boundaries introduced to

prevent the transmission of the virus. Most services and commercial activities open to the public adopted **transparent partitions** as a physical boundary between employees and clients.

COVID-19 also showed us that several organisations had to remove some limiting **legal, procedural or cultural** boundaries to allow business continuity. This opened up the opportunity for radical innovation.

Remote working removed the very rigid constraint of working from a designated space in a designated time frame.

It also removed the boundary between personal, family life and work life.

Teleworking removed the constraints created by physical distance. Ideally, people were "closer" to each other, they could "meet" more frequently irrespective of their physical location. At the same time, it introduced a very rigid boundary that did not allow personal contact.

Several boundaries and constraints were not considered or changed. For example, **no constraints were set or modified to regulate the movement of goods**. Trade was impacted

only when limitations to the movement of persons affected a component of the production/distribution system, or when the goods were deemed of strategic importance.

Communication in COVID-19

During the crisis, several concepts dominated mainstream communication and acted as "catalysts" or attractors to create a particular disposition in the public.

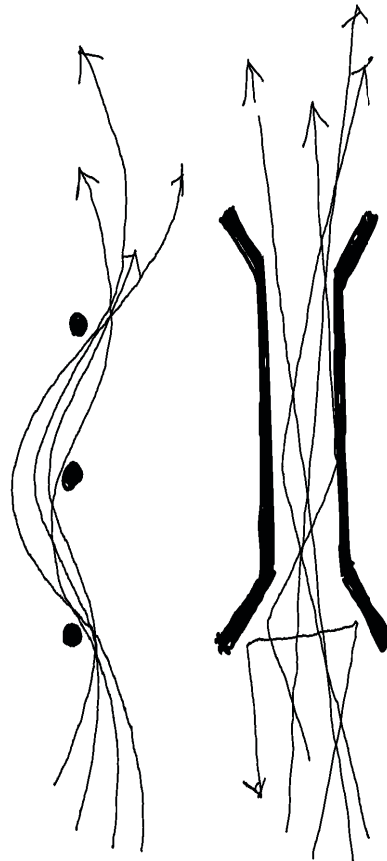
Flatten the curve was a very powerful concept, useful to reinforce legitimacy of confinement and social distancing. **Figures** of new ill cases and deaths reinforced the urgency of compliance.

Expert opinions overlapped and supported contrasting positions.

Decision makers adopted distinct strategies and forms of communication with civil society. Some opened formal, direct communication channels for local assessment and ideation of solutions, others opted for a more top-down approach.

Assess

Types of constraints



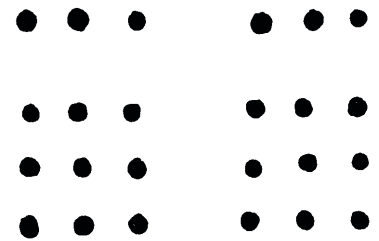
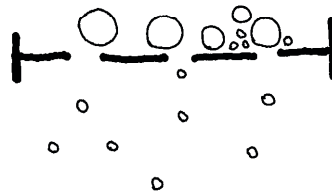
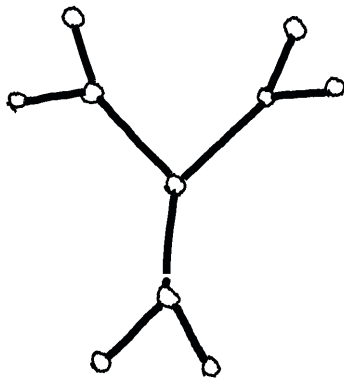
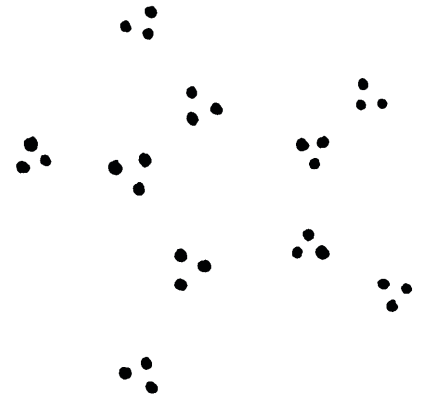
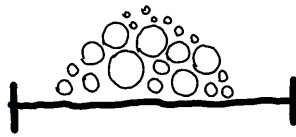
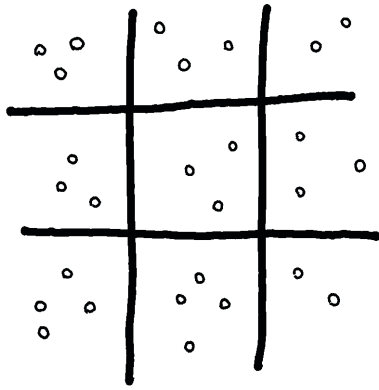
Governing/enabling

Laws, rules and codes create governing constraints. They give a sense of stability but are sensitive to change. Heuristics and principles, on the other side, provide guidance while allowing for distributed decision making. Mining the organisation's narratives for examples of heuristics that have evolved over time, based on expertise and experience, is a key audit process. They are then consolidated, codified in memorable form and associated with teaching stories for rapid distribution. Measurability of compliance and a focus on concrete are key, abstract platitudes don't work.



Internal/external

Insects have exo-skeletons which limit the size to which they can grow but provide a clearly visible structure; mammals have an endo-skeleton which makes them all self-similar but with wider variety and fewer limitations on growth. Organisation design tends to focus on creating a skeleton, or scaffolding, and 'points of coherence' around which units interact with each other and with the scaffolding itself. This is the case of ritualised meetings, performance evaluations, career assessments, etc. As far as external boundaries, think markets, resources, social foundations and environmental ceilings.



Connecting/containing

Connections, like hashtags in knowledge management and links in networks, provide a flexible and adaptive structure but at the cost of visibility and control.

Containers, like categories, spreadsheets cells and departments, provide clear, reassuring boundary conditions.

Changing connections between people and organisational units is less costly than trying to restructure or re-organise departments. As new connections start to provide new ways of dealing with issues, then the constraints can be tightened and eventually formalised into new units and departments.

Rigid/flexible/permeable

Deadlines are an example of constraints that are usually intended to be rigid. Flexi-time is a malleable way to manage attendance at work. Rigid structures resist until their design conditions are exceeded at which point they break catastrophically.

In contrast, flexible structures adapt to stress and conditions of constant change.

Rigid and flexible boundaries increase their resilience with permeability, or special conditions that allow for exceptions, but permeability brings the possibility of clogs, i.e. too many people applying for or expecting exceptions.

Dark constraints

A reference to dark energy or dark matter: we can see the effect of a constraint but we don't know the cause. Dark constraints are like the several hidden meanings a term can assume for different people. When we mention a term and we see different reactions, we see dark constraints at work. Narratives are powerful antidotes against dark constraints. We can also get a sense of the risk going forward by modelling how much of the past we can explain by the constraints we are aware of. The more we can't explain, the less we can monitor, the more likely unexpected and potentially catastrophic surprise.

Methods for assessment

Start journaling

Journaling creates precious learning material across the entire crisis. Start early and sketch as much as possible. Visual journaling provides thick data, synthesises more information in a smaller space and allows for quick scanning and detailed recall:

- start sketching, basic shapes will do;
- if a concept is too complicated, use words. Avoid long paragraphs;
- use the space to cluster and connect. Focus on relationships.

Gestalt principles

The way our brain processes visual information is the result of an evolutionary process that filters and reduces information to a bandwidth we can assimilate (we covered attentional bias earlier in this guide), while associating automatic response patterns to what we see. The main purpose of all this is to help us navigate reality and react quickly to unforeseen situations.

In the early 1900's a group of psychologists researched these response patterns and formulated a series of principles of human perception, which were further explored by artists, architects and designers at the Bauhaus.

Those basic laws are still used today in communication, branding and advertising to capture our attention, generate emotions and elicit a response. They will help us sketch more effectively.

Founding principle

All the gestalt principles that we will discover in the next examples stem from a basic one, formulated by Kurt Koffka as:

"The whole is other than the sum of the parts."

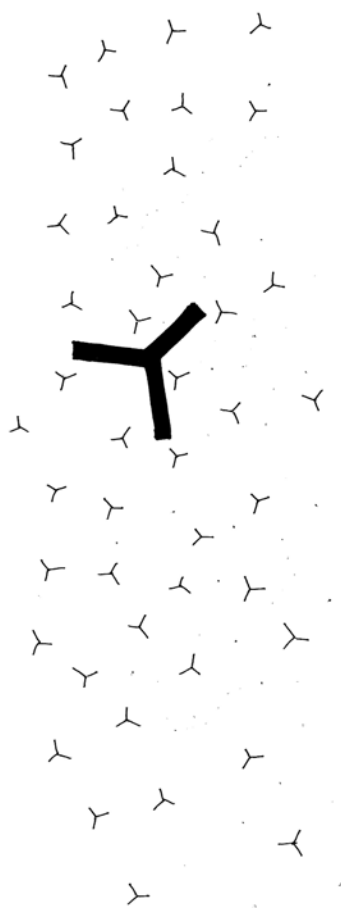
Note how he says "other", not "more".



Past experience & people

If we are taking notes about our organisation, we will inevitably need to draw a human figure. In most cases a circle for head and an additional almost random shape will do. Our brain's past experience will tend to transform the doodle into a person.

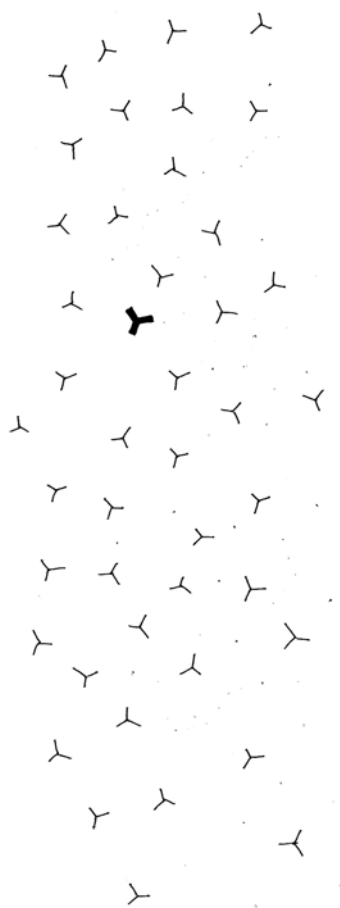
Try yourself!



Figure/ground

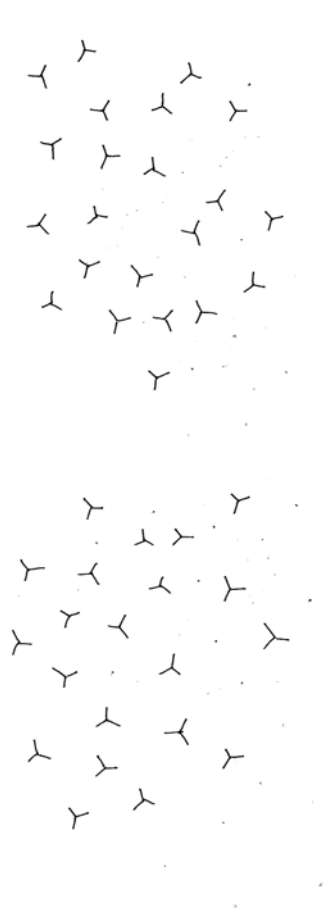
Our brain divides the elements of an image into background and foreground, and sees the foreground first. This allows us to guide the reader's eye by placing in the foreground what we want to emphasize.

Size often matters.



Focal point

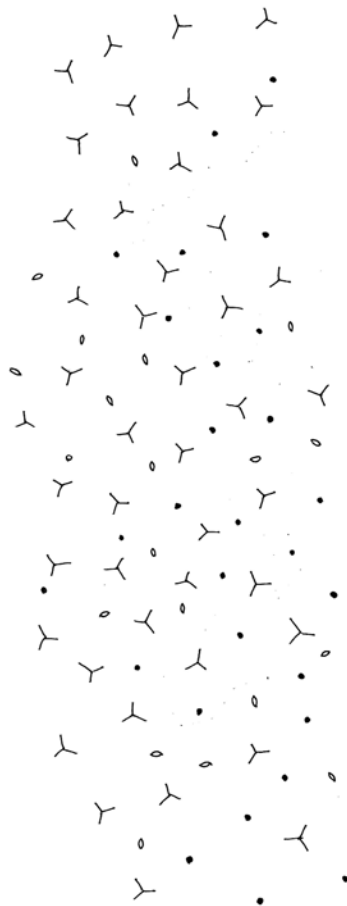
We tend to see first and focus on any element that breaks a pattern or that is clearly distinct from the rest of elements in a uniform distribution. We can use this principle to guide the attention of the reader and influence the reading order.



Proximity

Elements clustered together are automatically seen as one entity. Clustering is a common exercise in visual reasoning. It allows us to create a synthetic view of several contributions without losing detail. Clustering often helps to create rhythm and harmony.

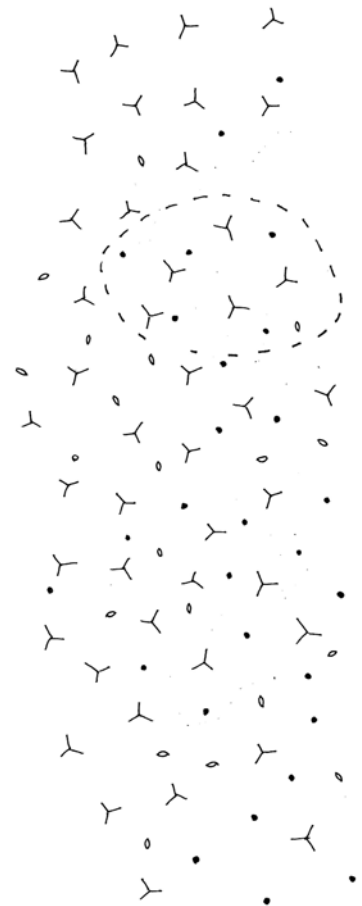
Try yourself!



Similarity

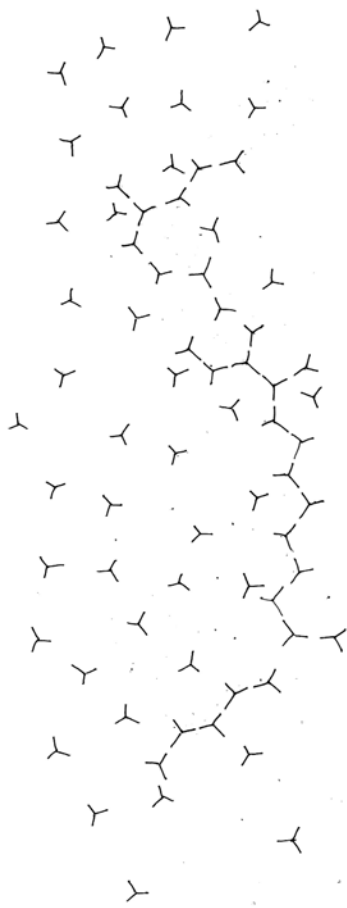
We tend to group together signs that look similar, and to think that they share the same properties.

We can use this principle to assign properties to signs. We may need a legend to help the reader identify the properties of each sign.



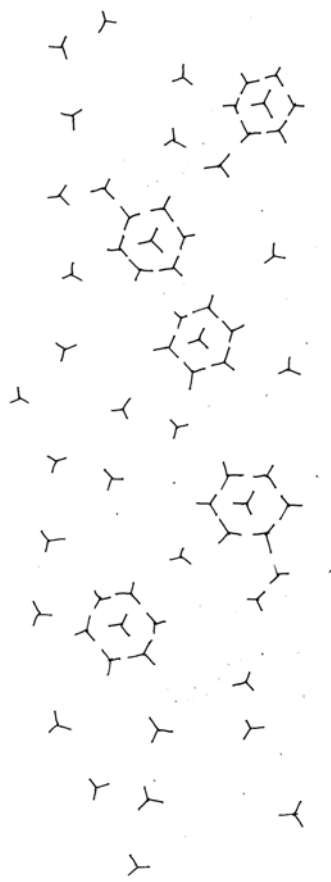
Common region

If individual elements are contained into regions, we identify clusters or regions first, then we notice the properties of the individual items. We can use this principle to create relationships among items, even when they look dissimilar.



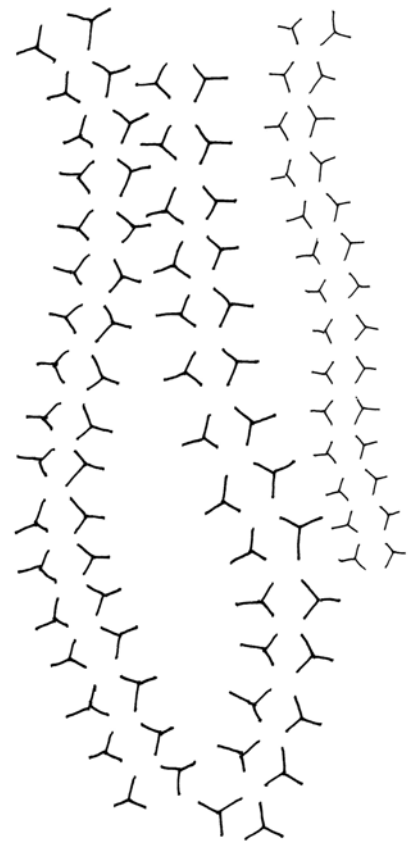
Continuity

We tend to perceive elements in a continuous flow, coherent with basic shapes or with the natural motion of objects in nature. Even when the flow is interrupted, we often "close the gap", by projecting a trajectory or by privileging simplest forms.



Closure & past experience

Our brain tends to generate closed shapes by recreating the missing parts of an image. We can work elegantly with empty spaces knowing we will compensate by scanning through the patterns that we have memorized in our previous experiences.



Symmetry

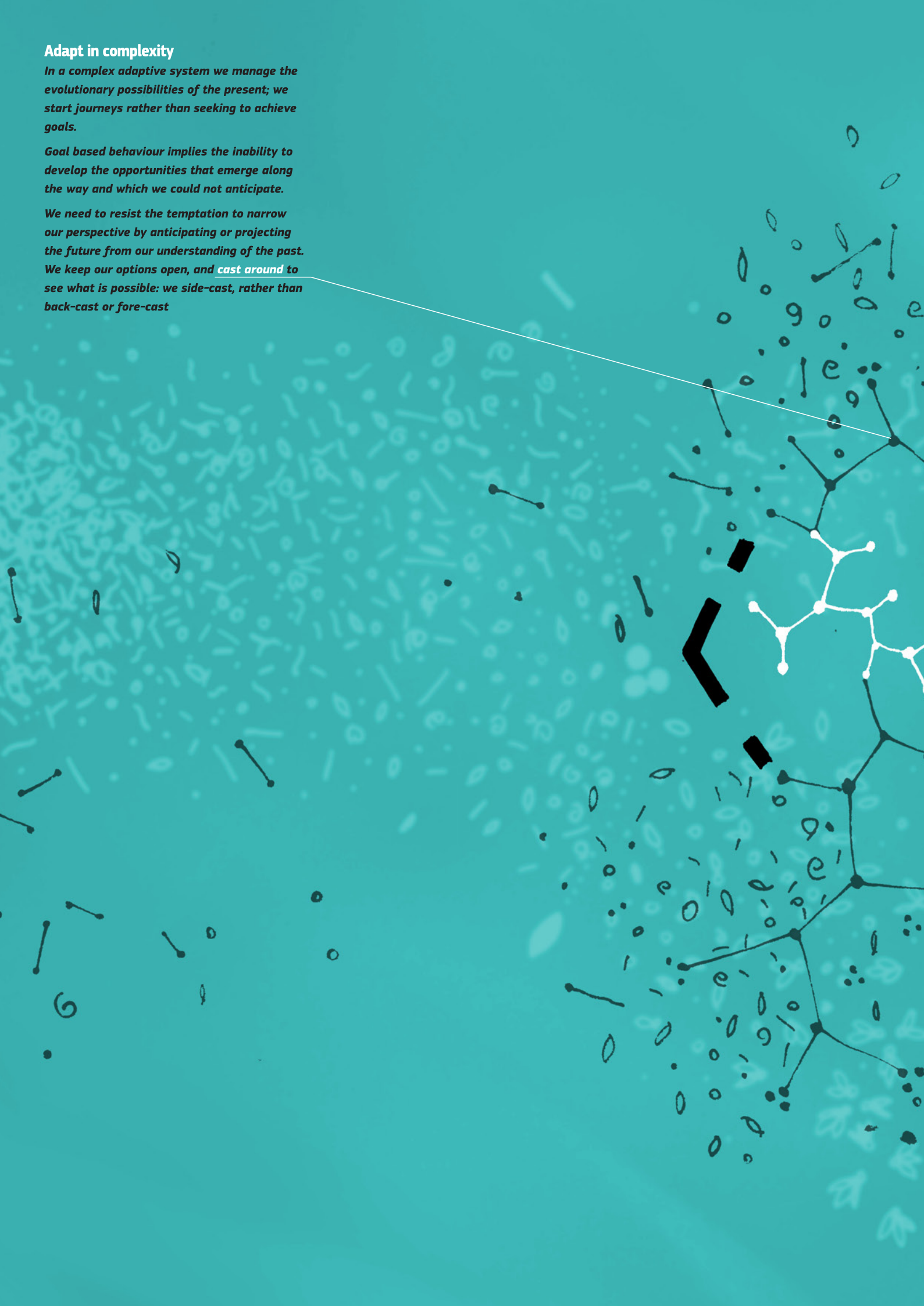
Our mind tends to recognise objects as symmetrical forms around a centre or an axis. Symmetrical lines will then be perceived as boundaries of a shape. Shapes with symmetrical properties will be clustered into a more complex, unified object.

Adapt in complexity

In a complex adaptive system we manage the evolutionary possibilities of the present; we start journeys rather than seeking to achieve goals.

Goal based behaviour implies the inability to develop the opportunities that emerge along the way and which we could not anticipate.

*We need to resist the temptation to narrow our perspective by anticipating or projecting the future from our understanding of the past. We keep our options open, and **cast around** to see what is possible: we side-cast, rather than back-cast or fore-cast*





Adapt

In lack of a contingency plan, we must reallocate resources and re-design processes to empower the emergence of small, informal teams and networks that will help us make sense of the new, changing landscape.

Manage constraints: We reduce hard organisational constraints and introduce flexible boundaries that allow to gain control of chaos and buy time for an organisational shift.

Coordinate, do not decide: distribute decisions to informal networks, centralise coordination.

Communicate by engagement: create informal employee networks to help assess the situation and to contribute to taking decisions.

Avoid premature convergence: keep options open as long as possible.

Adapt in complexity

Manage (or manege) constraints

Monitor dispositions and manage constraints to detect beneficial behavioural patterns.

Monitor:

- dispositional states;
- propensities;
- identities;
- attractors;
- attitudes;
- weak signals;
- coherence.

Manage:

- constraints;
- connections/linkages;
- roles and rituals;
- catalysts;
- granularity;
- diversity and dissent;
- cadence.

Manege

The English verb "to manage" was originally derived from the Italian maneggiare, meaning to handle and train horses. In this earlier meaning the emphasis is on learning with, abiding with, adapting to, respecting, and working with another complex entity: the horse and rider as coevolving brambles in a wider thicket of social traditions surrounding beauty and form.

Around the early 18th century, this original meaning merged with the French term menage, or household, making it easier to adapt the meaning of the combined term manage to the metaphor of the obedient machine, to the corridors of power, and to the actions of controlling and directing.

The naturalistic approach we have advocated, in effect a return to manege rather than manage, is the most effective way to achieve results in organisations made up of real people "

Kurtz & Snowden

"Like Bramble Bushes in a thicket"

Continuously mapping and updating constraints within a system is key in complexity approaches.

In organisational terms, we set boundaries and constraints every time we assemble a business "unit" or define its roles and prescribe what may, should and must do. "May", "should" and "must" being obviously an example of different degrees of rigidity.

We also set boundaries when we combine several units and decide the protocols for their communication, including frequency, tone and information channels. Formalised processes, timeframes and milestones are boundaries.

Policies that govern the exchange of information and knowledge across the organisation are also forms of boundaries. Beliefs, biases, fixations, subjective and/or collective a-critical assumptions are further types of powerful and sometimes "dark" boundaries among which definitions, categories and classifications as "the" example of the most explicit, rigid (and contextually fragile) form of constraint.

Of equal if not even more importance are those boundaries that may have not been set explicitly but that are equally perceived or

expressed through **routines and habits**.

Crisis may force us to remove, change or introduce many of such boundaries. It also gives us the opportunity to enter proactively in a deliberate design phase and use the new context as an alternative frame to question the status quo. In the next pages this is identified as a stage of **dispositional exaptation**, or a state where we willingly re-frame the problem space and prototype several different ideas in order to improve our organisational setting and/or the quality of our outputs. Re-framing is common practice, beyond crisis, in strategic design and in design labs, where ad-hoc methods promote a form of open, critical observation of the present. They represent a "natural science's" approach to understand a context by mapping the landscape of agents and their observable interactions beyond expectations, regulations, guidelines, and norms.

Here, the problem space is rarely given for granted and is allowed to co-evolve when known and unexpected challenges start to emerge.

Assessing the current situation "as is" in terms of existing and changing boundaries provides

ideas for new organisational practices that may be more beneficial from an economical, societal or environmental perspective. Effective constraint management and redesign is all about trying out several options starting from the current assessment. From here, we seek to enable the emergence of resilient solutions with a low level of risk (high informality) and energy (high spontaneity). If we haven't produced a map during the initial assessment then it's now time to do it; the section on mapping landscapes provides some useful tips.

Once we have a map, we can ask ourselves three key questions:

- What are the issues and the opportunities in the context we just mapped? **What can we change of the current situation?**
- Out of the things that we can change **how can we monitor the impact** of that change?
- Out of the things that we can change and monitor **how can we rapidly amplify success** or mitigate the impact of failure?

To introduce safe to fail changes, we can, for example, add informality to a very rigid process (which is how we transform a fixed

constraint into flexible), change the connections among people, establish rituals, reinforce identities, change (preferably shorten) time horizons. In all cases we monitor what happens, ready to quickly revert the experiments that go wrong. Carrying out safe to fail experiments "playing" with constraints and with motivational attractors (known as catalytic probes), is one way to always seek out the unseen possibilities. We call **side casting** this form of "casting around" to see what is possible. The technique, coupled with **abductive research**, or seeking patterns in the tails of distributions, is also known as **weak signal detection**. Abductive research opens up the range of experiments and prevents us from jumping too quickly to conclusions, which is very risky in conditions of complete novelty. Finally, opportunities rarely come around again: we need to seize the day.

A good practice to spot such opportunities in crisis is to keep special attention to the odd ones out of the average consensus, especially if they manifest some form of deep criticism.

Managing constraints in COVID-19

We saw earlier some example of boundaries and constraints set during COVID-19.

Can you spell out which of those constraints was changed in the progression of the crisis in your country? Which were relaxed, made transparent or permeable? Which ones were made more rigid or re-implemented?

If you had to evaluate the management of constraints by your organisation or by the public administration in your region, what would your assessment be?

Adapt in complexity

Reduce granularity

Fragment information, capture rich data. Increase communication and awareness: embrace repetition, be as transparent as the situation allows with a bias towards overtransparency:

- build crews with the 5/15/150 heuristics in mind;
- keep objectives tight and real. Do not pursue over-aspirational visions. Provide empathy and direction;
- immediately shorten operating cadences:
years>quarters, quarters>months, months>weeks, weeks>days;
- promote fragmented, self-directed learning vs. directive learning.

Organisations designed for stability rarely survive the transit into unstable, unpredictable times as long term objectives and planning cycles are unable to respond to sustained change. Smaller 'units' can combine and recombine in different ways and are more dynamic and agile in nature.

The readjustment is necessary as soon as we detect a crisis: waiting can be very costly or catastrophic.

Organisational units (5/15/150)

There are some natural numbers which come into operation here.

Five is a cognitive limit and the deep knowledge to manage a crisis means that command teams or deployed units of less than five are more effective.

Breaking down traditional silos to this level of granularity and adding overlapping members gives us the flexibility we need. Committees of 20+ people need to be reduced to crews of 4/5 mission-oriented players (missions orientate teams across silos).

Fifteen is a natural limit for deep trust and this is naturally present in informal networks and associations but difficult to create in a

formal system in short order.

One hundred and fifty is a natural acquaintance limit for humans; in a clan (that is the structure we evolved from) there are rarely more than that number.

This size allows us to know the capabilities of the rest of the clan and to operate more cohesively as a result.

In practice this means breaking down the organisation in coherent groups of less than a hundred, as our employees also have relationships to maintain outside of work.

Crews

A crew is a diverse group able to focus and act without preparation. It is based on clear roles and identities: we need to secure at least an expert, a naive and an operational role. We can use a Belbin test to detect the primary and secondary traits of each participant.

To turn generic groups into effective crews we must ritualise interactions, to help members of a crew to enter in their role and maintain it or shift it when needed.

We should also run social network stimulation exercises, described later on, at least on an annual basis.

Goals and missions

We need **short(er) term goals** distributed over different crews. We may even need to probe for the unexpected using contradictory objectives to ensure resilience in our actions. Activity should be sustained in sprints with those short term, clear objectives in mind. Reporting cycles also need to be short and anyone with a relevant message or key insight should have direct access to the centre.

Mission teams should focus initially on short term stabilisation, then on medium term change. The idea of a mission allows us to bring in tools and techniques to convey what is known as **commanders intent** which allows for adjustment on the fly.

All and any objectives or missions should **focus on the adjacent (short term) possibles** and should be rapidly adjusted and reset as needed.

Information

Anyone familiar with social media will know that small information units get picked up and amplified more than long documents and papers. Narrative or micro-stories can convey more context and meaning than structured

text. They act as a mediator between highly codified and structured information and deep craft skills.

Rapid communication that can be absorbed quickly requires a different way of thinking. Social media, blogs, and peer to peer learning journals all provide this type of fragmented learning and knowledge transfer/creation.

The time for formal documents is after the crisis is over.

It's worth remembering that text is not the only vehicle for communication: photographs, brief videos and cartoons are also valuable. Techniques using archetypal characters and persona also draw attention and can often convey more complex meaning than a written page.

Diverse perspectives, not only "more stories like mine" but also "stories that contradict mine" and 'surprise me' queries are also useful.

During a crisis people's natural tendency (if they are not personally threatened) is to seek out novelty - we should exploit this.

Learning

Learning is more effective if it is embedded in real time, critical tasks. Learning by doing is

almost an imperative during crisis.

As much as possible, turn any activity led by an expert practitioner into a learning opportunity for the other members of the crew. Use screen casts or shadowing techniques to show the operational choices.

Periodic, high frequency reporting is a further opportunity for spot learning.

This approach fragments learning into self-contained, practical capsules that are coherent with the flow of priorities.

Adapt in complexity

Create specialised crews

We can't afford for everyone to be involved in everything (it wasn't a good idea even in normal times). Old forms of consensus are going to have to go out of the window fast:

- assemble specialised units, responsible for local decisions;
- set a reporting method to create awareness across crews;
- weave their findings.

Specialisation does not equal internal uniformity: vary the composition and skills of each crew.

Unintended consequences

After the successful use of the Cane Toad to eat beetles threatening the sugarcane plantations of Puerto Rico, 102 Toads were introduced into Australia in 1935.

It not only failed to reduce the grey-backed cane beetles but had a massive negative impact on Australian diversity.

It represents a case study in unintended consequences

The following are all permanent and focused crews. They need a cadence of reporting, more frequent at the start, then different patterns of reporting will become self-evident.

Reporting will always be a balancing act between providing access to the centre (necessary for coordination and motivation) and preventing the centre's diaries being filled up with time consuming reports.

It is a good idea to train junior staff to record visually what is happening in each group and have periodic summaries with them as a reporting and synthesis exercise. We can meet all crews at the end of the day in an informal setting.

The probing crew

Members of this crew include lateral thinkers (strategic designers, user experience designers, service designers, artists), business correspondants, software engineers and the organisation's most creative old foxes. This crew has a special talent in **creating people-centred scenarios** to explore novel concepts with the intention of transforming them into usable, tangible proposals and prototypes. They will need to engage frequently with the

centre to update their thinking with the latest strategic developments.

A probing crew is essential for radical repurposing.

The wrecking crew

The only predictable aspects of a complex system is that whatever you do will have **unintended consequences**.

The unit is often comprised of mavericks and trouble makers. It is there to "**war game**" **decisions** looking for possible unintended consequences, and then monitor for both the expected and unexpected occurrences. They then create recommendations to mitigate any negative effects, but also to rapidly amplify unexpected positive results that might otherwise be missed.

The journaling crew

Any retrospective learning is deeply suspect, as hindsight is always mediated by selective memory and by the political needs of the present.

So at the commencement of the crisis if we haven't already got systems in place for real time capture of lessons as they are learnt,

together with ideas for innovation, we need to get them in place fast. If the key actors are too busy to record, then we can appoint apprentices or trainees.

Micro learning is critical and also provides an evidence based protection for key decisions made without time for full evidence to be gathered.

This applies at **all** levels of the organisation; the central decision makers need to **ritualise journal keeping**.

It can be very useful to include knowledge asset mapping into this as well as morning and evening reflections.

Making this data available for peer to peer information flows during the crisis is also critical. It is a part of distributed decision making to create such flows.

The continuity crew

While the crisis is consuming the attention of our key decision makers this is the time for their deputies or for the more experienced members of the crew to **take over the day to day business** of the organisation in so far as it continues. Rapid transfer of authority coupled

with checks to make sure that key decisions are not inhibited by past practice is the order of the day.

The data analytics crew

Data informed decisions are key in a crisis but conventional departments need to keep day to day operations running.

We need to cherry pick a mixture of bright young people as well as some experienced people, some academics and some strategic designers and get them working fast.

They can also **activate and synthesise weak signal detection** using human sensor networks.

The healing crew

Again not the conventional group here but a crew with **organisational development** and **personal health specialists** that include some of the cynics from the organisation to help.

The cynics in any group are the ones who care enough to speak truth unto power and we have never needed them more. Attitudinal pulses and organisational horizon scanning carried out by this crew will allow us to create a powerful decision support capability but will

also allow us to carry our employees with us on what will be a difficult journey.

Adapt in complexity

Distribute engagement

We need distributed sensor networks and fast feedback loops to detect and manage weak signals:

- collect the experiences of staff and stakeholders as the crisis unfolds;
- visualise the dispositional state of the organisation analysing the experiences;
- detect opportunities to increase the number of stories that get us closer to a beneficial transition.

Distributed human sensors networks

Cognitively, culturally and experientially diverse groups of people to whom we have direct access, assessing the situation independently of each other without the chance of cross connection.

Technology can be used to make those networks available in real time to provide both situational assessment, option identification & evaluation together with micro-scenarios planning. We will see more on this topic in the next chapter.

The manner and timeliness by which we engage with the organisation and its stakeholders requires substantial change from the periods of more stability. Reporting cycles are usually too slow and formalised to cope with fast paced events.

This means that we need to distribute the perception and accelerate the exchange of information and knowledge, focusing on early detection of weak signals. Then, we will make sense of all the observations using an abductive approach to find patterns of coherence and ideas for intervention.

A contrast is often made between big data (algorithms) and thick data (ethnographic studies). The former working of high volumes with basic but not deep meaning, the latter working with lower volumes but with deeper meaning emerging over longer periods of time. By making employees ethnographers to their own environment we create rich data, quantitative in nature, that can support sophisticated learning and decision making at all levels of the organisation.

Visualising the dispositional state of the experiences of employees through their own

stories, anecdotal observations and perspectives, based on real time data is not only possible but is proven in practice and provides a quantitative approach in what is traditionally a qualitative domain.

Consultation fatigue

Most members of any modern organisation are subject to consultation fatigue. What is key to ensure a good level of participation is not only the perceived value of surveys but most importantly the ability of the respondents to access the results for their own sense-making.

People are not per se motivated by providing information to other people or to the organisation, they need a return in terms of insights and knowledge. This can be achieved by giving participants the ability to access the pool of experiences.

Using the micro-narrative approach proposed here we can create 'narrative packs' that provide local utility and which *de facto* add participants (with their consent) into a human sensor network of considerable power. This provides valuable material for decision support and create more objectivity when making decisions under conditions of high

uncertainty. By using the wisdom of a crowd that is already engaged in policy we can increase our ability to identify outliers and bring novelty to the attention of senior decision makers.

We have several options to engage the crowd in distributed exercises.

MassSense

In this mass situational assessment a network of human agents receives and interprets a set of infographics, text, video, etc. creating descriptive micro-narratives of their assessment. Optionally respondents can contribute their own micro-scenarios describing their own perspective of potential futures.

Journalism and journal keeping

Here a designated sample of the population keeps a daily, weekly or similar journal relating to a topic and also act as journalists by interviewing other people they know. Some of the most pioneering applications of this technique have been to engage young people, working through schools, sports clubs, churches and the like as ethnographers to their own communities. Once such a network

of employee journalists have been established, it can be used as a human sensor network to provide fast feedback to questions by responding to MassSense interventions as described above.

Attitudinal mapping

This is an alternative to the traditional survey and works on the basis of asking respondents a question (ideally without any hypothesis) to generate a micro-narrative which is then self signified by the respondent directly. Material gathered can also be re-signified by other designated parties. Data results can be presented to decision makers (and to respondents) in real time to show patterns for sense-making along with various analytics.

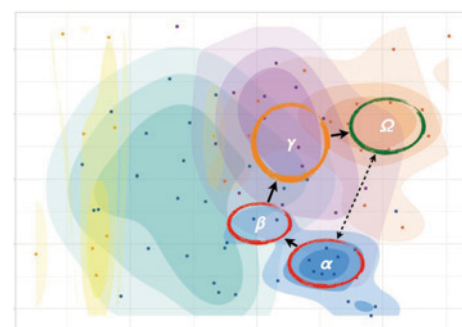
Navigating complexity

Vector theory of change evolved from complexity theory and measures direction and speed of travel, or intensity of effort from where we are.

Vector measures and fractal engagement pick up the idea of starting journeys with a sense of direction vs having a pre-defined end-point. The visualisation of data from the three capture methods above allows for a simple

question to be asked: "*What can we do tomorrow to create more stories like these and fewer like those?*" This question can be asked of anyone regardless of educational level and is non-pejorative in nature as well as highly concrete and pragmatic.

In the figure below is an attitudinal map, created in SenseMaker, a specialised application. The concentration of dots (each



representing coherent clusters of stories or observations) indicates a need to shift from the alpha state to omega, but the distance of that shift is great and the risk high. An alternative is to shift to an adjacent possible beta state before moving to gamma and then to omega. For each move the decision maker and the supporting group are able to click on the visualisation, see the underlying micro-narratives and then ask the question outlined

above. By continuously updating the database with new stories resulting from the decisions taken, it is possible to immediately visualise the new concentrations and automatically adjust course, or correct without significant cost.

Using these maps we can define vector measures (direction, velocity, energy) which can act as KPIs for complex environments. The addition of explanatory narratives to statistically valid data provides explanations and a more ready means for change.

Fractal engagement

The previous example shows one layer of engagement. From the same source data we could represent the dispositional landscape of an entire organisation, which would allow senior decision makers and cabinets to ask *“What can we do to create”* and identify options for the generation of new policy. We could also use only a part of that same dataset to enable, for example, different departments, or different competence groups, to ask the same question to their member. One question, different contexts.

This contextual alignment is key to cultural

change and avoids the homogenising effect of treating the whole system as single homogenous entity.

Advanced analytics & alerts

The tools used to support these exercises should provide an open API structure so that the results can be embedded in other tools.

We should also be able to export data for combination with big data material to create richer sources of evidence.

The software should contain analytic and reporting tools that can be used at a global and community level. The use of real world narratives can create more effective communication and instant narrative-based responses to negative tropes and “fake news”. These may be emerging risks, or opportunities, but the key value of these alerts are making decision makers aware of when they need to pay attention; providing advanced weak signal detection.

Examples

City of Malmö

Malmö Municipal Government Executive Office commissioned a city wide horizons scanning inquiry. It administered the approach through collaborating with a youth organization who worked with the Cynefin Centre to design a collection tool (app/website), train and coordinate 40 young people on work placement to collect stories from across the city.

In year one the scanning addressed the biggest challenges and opportunities facing the future of the city, mapping such issues against social, economic and environmental aspects, as well as equality and inclusion. Over a 3 month period a significant volume of micro-narratives were collected from a variety of citizens.

In year two which is currently ongoing the center has further developed the questions and has been sponsored by the municipal government executive department in collaboration with the department for planning. The stories and data collected will be used as a baseline and form part of a longitudinal study of citywide horizons

scanning and planning. Within the first 2 months over 5,000 stories have been collected.

Future Generations Commissioner for Wales 'The People's Platform'

The people's platform is a participatory initiative from the Future Generations Commissioner of Wales, seeking to engage the people of Wales to better understand and tackle:

- the biggest challenge facing the immediate future of Wales;
- the biggest challenge facing the longer term future (25 years +).

It was designed to understand issues, crowd source potential actions and interventions, as well as acting as a barometer on perceived responsibility of business, communities, governments and public services.

It is used for horizon scanning, planning and citizen involvement in priority setting. Insights and recommendations from the People's Platform have been integrated throughout

Valleys Stories

Stories of the Valleys is all about bringing to light the everyday, yet important,

conversations that occur in communities, schools, colleges, the workplace, sports clubs and beyond to encourage people to explore and understand key issues in their community, including new ways of addressing these issues together.

Live at <https://valleystories.com/en>

The Social Economy Diaries

The diaries are a compilation of stories about the impact of social economy in Europe and beyond. The exercise intends to show, through the voice of practitioners, how a resilient, regenerative form of economy is not only possible, it is actually a reality. Participants are asked to tell a story about their experience and position it in a signification framework that will offer insights on the specific needs of this economic ecosystem. The project is run by the European Commission's Directorate General Joint Research Centre in collaboration with Directorate General for Internal Market, Industry, Entrepreneurship and SMEs.

Live at: <https://europa.eu/!xb89vD>

Adapt in complexity

Create a human sensor network

Formal and informal networks developed in times of stability can be activated for extraordinary needs:

- equip your organisation with networks of people that have a special interest in observing their context;
- merge their journals with data collected using traditional tools like social media analysis, data analysis, surveys and polls;
- design customised journaling programmes and embed the activity in the organisation's routine.

Human perception and risk management

Both risk and opportunity emerge at the edges of human perception and bringing the attention of decision makers to those weak signals is key.

The SEE-ATTEND-ACT framing argues that seeing the data, paying attention to the data acting on it are separate processes. Given that we do not see what we expect to see, this is a problem. Also the myriad of weak signals presented to decision makers daily impacts on their ability to pay attention, and even if they do pay attention, the willingness to act is another matter. To give a real example, authorising military aircraft to intervene against a hijacked civilian airplane is an easy decision to make after the tragic events of 9/11, but before? The context then is one of tragic accidents, not terrorism thwarted.

Creating a culturally, experientially and educationally diverse sense-network provides confidence in decision making and increases the probability of identifying outliers, or weak signals that will later prove significant.

Critically, it also hardbacks advocacy into evidence. The process of citizen engagement in distributed decision making reduces the risk for political decision makers. The corollary also applies in industry and the wider public sector.

The purpose of a human sensor network is to create an opportunity for leaders and the wider organisation to gain real time situational assessment, to evaluate options and to create, test and monitor micro-scenarios. The SenseMaker approach to human sensors networks, of which we saw an example earlier, was developed for counter terrorism in DARPA projects before and after the tragic events of 9/11. In that context, one of the requirements was to create an objective approach to decision making where only adductive logic –the logic of hunches – is appropriate. It drew on ideas popularly known as the *wisdom of the crowds*, in which a cognitively, culturally and experientially diverse network of respondents looks at a problem in parallel without knowledge of each others choices.

This aids in identifying outlier behaviour, giving voice to the 17% (see page 10).

While such a network can be set up quickly in a crisis, it is preferable to proactively have it in use for ordinary purposes, so that agents in the network become familiar with its function. Familiarity reduces learning and adoption time; continuous use, and patterns in use,

allow decision makers to detect bias and enable anticipatory awareness.

Two other related approaches can be used, yet with some drawbacks.

Social media monitoring, data analysis, sentiment analysis and the like are part and parcel of understanding a market or citizen response. But *anything that an algorithm can interpret and algorithm can create*. There are dangers, for example, for social media to become an unbuffered, easily manipulated feedback loop and as such to tend to perversion. However such approaches have a necessary, even if not sufficient part in understanding what is going on.

Polling and surveying a network with direct questions have high utility but capture ostensive or surface response and are subject to gaming. They fail to capture nuances, reducing their ability to detect weak signals. They are also less good at sentiment analysis and at understanding underlying attitudes where choices are not binary but complex in nature. For these we need the high abstraction signification of a sense-making approach as discussed earlier.

The good news is that all organisations have the capacity, when aided, to work with human sensor networks. This can be done most easily by designing a work programme, for example, with Governments wishing to work collaboratively with their citizens to create *asymmetric* advantage in the face of threat.

The general approach is to provide people with tools they can use, and find utility in, under day-to-day circumstances. These same tools in turn enable capacity across the organisation to generate insights and take action.

There are many types of programmes to increase the number of human sensors available in a network - either as conscripts or volunteers. To varying degrees they apply to industry and government alike, but only government would realistically have access to some of them.

The list is by no means exhaustive but presents some examples to illustrate how these programmes might work in practice.

Learning journals for new employees during their induction period and ideally for three to six months. In addition, they could perform weekly or monthly interviews to senior staff

and gain insight and experience into the organisations' own history, to look specifically at possible futures. This is also a way of getting access to senior staff who would not participate in a consultancy process. A variation uses **programmes such as *bring your daughter to work and schools work experience***. Here the children are assigned similar interviewing or observation tasks. Finally, executives or managers on leadership development programmes could mix learning journals with interviews for the duration of their programmes.

Replacing and augmenting traditional workbooks with continuous journaling.

This approach was experimented with military personnel in Afghanistan where company commanders replaced patrol reports with journals in the field. There was no shortage of volunteers and the distributed human sensor network combined with military sensors (drones, satellite scanning, ground sensors, etc.) was extremely efficient to give real-time feedback - no more waiting for patrol reports to be collected and synthesised. Variations were to **employ countries' commercial embassy staff** to record details of activities

and meetings in return for not writing reports. The same applies to sales staff.

Many **schools have a requirement to teach research techniques and statistical analysis along with community engagement**, in fact it is a key part of the baccalauréat. By providing resource packs to teachers for pupils to engage as citizen journalists in their communities as part of a school year project, governments can very quickly gain access to the street stories of local communities. This network can be activated in the event of a crisis for feedback or communication. In a very real sense this also allows us to understand the current and future state of a community through the eyes of a future generation. Similar programmes can be run for sports clubs, community centres, church groups, scout groups and the like. All of them have a need to understand why their various members engage, and make them a part of a network. The approach can also be deployed in citizen assemblies, juries and entire workforces or citizen groups for distributed budgeting. It provides a more balanced selection than simple demographics, and produces wider attitudinal maps.





[<>] or the aporetic turn

Even if we have followed the recommendations in the previous phases, at this stage we still may not know what to do and we may not have committed to hard choices.

We know that we are in a state of voluntary suspension, while the elements for an informed decision are brewing and a sense of somehow optimistic urgency is building up.

We are mapping the context and building evidence to get ready to move out of confusion.

The aporetic turn

Map landscapes from experiences

Narratives give insights on the disposition of the organisation. They also help identify agents, drivers of change, explicit and hidden boundaries, informal processes, challenges and opportunities:

- use narratives and micro-observations to identify agents, boundaries, roles and processes;
- map the landscape by visualising relations, proximity, size, quantity;
- position challenges and opportunities on the landscape. Take a step back and observe.

Gather information: in crisis we need a map (not a written report!) of the current state (not of the future!). A map of the landscape informs decision making with situational assessments and offers insights on the immediate possible.

Experiences, not just data: in complex systems it's not just about facts and data. It is also (and maybe more importantly) how those facts are interpreted by people and how they become thick experiences. Evidence needs to be read through the filter of several personal interpretations, expectations, projections to give insights of people's dispositions. The stories collected in mass sense exercises are the ideal start.

Engage the organisation: to capture weak signals of human attitudes and dispositions we should start to produce narrative-based journals with the team, to collect day-to-day stories. If not possible, we should organise periodic work sessions to listen to their experience. We can then map this into visual landscapes.

Maintain heterogeneity: we need to entangle narratives as told by executives, technical and

operative staff, stakeholders. Multiple perspectives keep us open minded on the crisis and give insights for action.

Retrospective coherence: when the crisis is over, everyone will create narratives to explain what happened. We need to beware of retrospective coherence as it is based on faulty, selective memory and creates a false sense of security towards the future.

How to visualise a system

The first step is to compile a list of key agents and lay them out on paper freely, or following a framework of reference (i.e. see Wardley maps and REA value flows models).

To reduce bias and oversimplification, we should avoid drawing the list of agents from theoretical knowledge or solely from experts' opinions and interpretations: we want to **build the system from real life experiences**.

Real life experiences place anecdotal facts in a rich context, providing multiple layers of meaning and bringing to life one of the key principles of management in complexity:

disintermediation. This approach is common practice in service design, where user experience matters more than ideal, preferred

or prescribed end results.

We should also engage with groups of heterogeneous participants, while a proper balance between abstraction and detail can be achieved by a well designed choreography.

A landscape is a necessary starting point to:

1. map the current state and the key challenges and opportunities, or what we can change;
2. identify ideas for action and decide what impacts we want to produce and how to monitor them;
3. start pilot actions with the intent of amplifying the beneficial ones and suppressing those who are failing.

Hidden trap: feedback loops

A common practice in systems thinking is to look for positive and negative feedback loops among agents. While the idea in itself makes sense, often feedback loops are inferred from past experience or from theory abstracted from a specific context. We need to avoid the temptation to automatically determine the existence and/or the direction of any feedback loop. The only loops we should include in our landscape are those that we

can observe in the current context and time frame.

Governance

A non-trivial question with deep implications is: who decides what we can change, how we monitor change and what change we deem beneficial?

If we are managing well a complexity-informed method, the answers emerge from the same group who is researching and acting in the landscape. This implies that **leadership is expressed through engagement and empowerment** rather than prescription and direction.

In this context, leaders become "strategic observers" and intervene to provide a meta-level of coherence and clarity to facilitate action and the exchange of knowledge.

Representativeness

A common objection to this method, often raised by scientists and academics, is how representative a low number of experiences may be. How many experiences are enough? How can we base decision on incomplete data?

When addressing complexity, "enough" is "all

is needed to identify emerging coherence".

Crisis management and more in general design activities, when understood as discovery of emerging practices, are necessarily **local, ongoing and experimental**. They must enable short term parallel, independent design prototypes using available, incomplete knowledge, not provide a long term panacea based on extensive evidence.

Implications

This suggests that public and private organisations that span several different regions need to establish meaningful processes of stakeholder engagement beyond user research to make sense of local experiences and build whole ecosystems from the bottom-up.

When these practices are in place, the role of organisations naturally shifts from "holder of the solution" to "facilitator of coherent, heterogeneous practices" with obvious beneficial fallbacks in terms of trust, transparency and cooperation.

The aporetic turn

Demo: map a simple story

A very simple exercise to deconstruct an experience and build a micro landscape.



narratives



constraints



roles



resources



issues



processes

Materials

- A whiteboard or a large piece of paper.
- Markers and stickers.
- Phone or camera to document the final results with pictures.
- Whiteboard and stickers can be replaced with an online whiteboard.

How to

Ask your employees to **share several personal experiences** about the crisis. Extend to beneficiaries and stakeholders when possible.

Use the stories to **identify agents and contexts or places**; be specific (i.e. better "local supermarket" than "retail", or "faulty data on victims" rather than "fake news"). Do not forget that, in complex systems, narratives are agents: map them.

Place agents inside/outside/across places on the whiteboard. **Link agents and stories.**

Mark boundaries and constraints:

hierarchies, rules, groups, physical obstacles, etc.

Mark flows and relationships.

Avoid assuming strict cause and effect, look for potential feedback loops. (i.e. more/less of this will cause more/less of that)

More stories give a better rendering of the situation.

If you plan to collect a lot of stories, you should **ask experts for help and use dedicated software**, such as Sensemaker.

What to look for

Look for the essential components of a system: roles, narratives, boundaries, resources and processes.

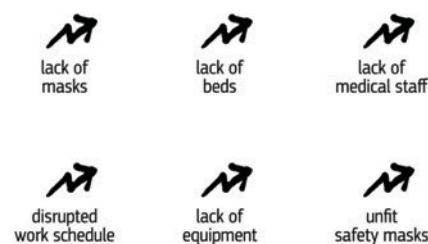
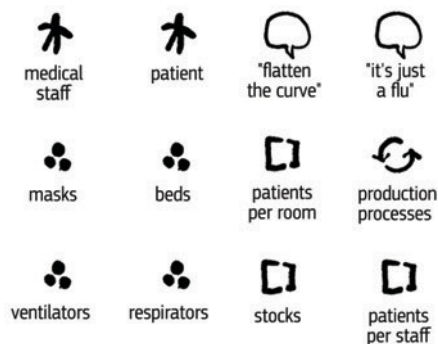
For sake of simplicity, in this demo, agents are persons in a specific role. In reality any entity that interacts with and changes the state of a system is considered an agent. For example in human systems ideas and narratives are powerful agents.

Deconstruct a story looking for all agents, focus on their interaction and identify all the boundaries and relationships that emerge.

Do not simplify stories for fear of "complicating" the picture too much. At this stage we need a high level of detail. Also, avoid the temptation to categorise and to fit everything into matrixes. Categories and matrixes are good to formalise results, not to explore a fuzzy context.

As much as possible, perform a "detached", open observation from several perspectives. We don't want only the picture painted by the 83%.

If you feel uncomfortable in keeping things "messy" at the beginning, ask for help from strategic or service designers.



Deconstructing the story

The experience above is deconstructed in:

roles - patients, medical staff;

resources - rooms, beds, masks, ventilators, respirators;

boundaries - number of patients per medical staff, minimal distance between staff and patients, minimal distance between patients, number of patients per bed, number of beds per room, number of masks available, number of uses per mask, etc.;

processes - work shifts, patient examination, restocking of supplies, purchase of equipment.

Combining several experiences would give depth to the landscape. If we were interested in deepening specific parts of the landscape, we could go back to the author with a draft illustration and further questions or even tap into our own experience.

Once the story has been mapped out, we can then experiment ways to manage or modify boundaries and ask the storytellers for feedback.

They will give insights on the feasibility of the changes we propose and on the dispositions that they may generate.

The landscape

We can now build a visual landscape starting from the deconstructed experiences.

This helps to anchor any conversation to the whole, no matter how fine the level of detail we are dealing with. Layers will help to break down thick data into manageable overlays.

The first drafts will be very "messy" and hard to read: this is normal. The process of refining the representation by iterating several different solutions is a reflective activity that produces mental clarity, its value goes beyond the visual quality of the final result.

This routine is most useful if performed with senior managers, as it helps to materialise "invisible" patterns. It also provides a holistic opportunity to discover new relationships, flows, insights.

For this exercise, we prioritise abstraction versus figurative approaches. We are more interested in the essence of the context and its challenges than in a detailed but confusing illustration. The final product will inform and coordinate the activity of independent crews and will provide a base to collect the result of their work.

The challenges

Once the landscape is fixed, we can use it to highlight contextual disruptions, challenges, opportunities.

The challenges can be inferred from the facts presented and also from the tone of the story.

A well defined challenge is an ideal starting point to form mission-based crews. Placing a challenge on the map helps the crews to focus on a problem while considering peripheral elements that could otherwise be ignored and/or go unnoticed.

It is worth remembering that a particular challenge may accept solutions of very different nature, some of which may be clear and apparent, some more complicated and others complex, each requiring a different set of skills, resources and timeframes. The next method helps to identify the nature of distinct potential solutions to the same challenge.

The aporetic turn

Discover opportunities for change

The response to a challenge varies depending on its nature and on its context. Lack of time, resources or knowledge may turn an otherwise clear decision into a battle against chaos:

- identify the nature of challenges in a given context as a precondition for action;
- use the exercise described below to define potential responses.

Materials

- A whiteboard or a large piece of paper.
- Markers and stickers.
- Phone or camera to document the final results with pictures.
- Whiteboard and stickers can be replaced with an online whiteboard.
- This exercise can be run retrospectively to understand how a set of challenges was addressed in previous occasions and reflect if the decision was the most appropriate, given the context.

How to

1. Source a flipchart or a large piece of paper. Copy the four corners of the diagram on the right (Clear, Complicated, Complex and Chaotic) and place "Confused" in the centre.

2. Place the challenge in "Confused".

3. Ask the crew to brainstorm individually on potential decisions/solutions that could address the challenge.

Time this step and assign a maximum of 10 minutes.

4. Bring the crew in a plenary session and ask each member in turn to list her decisions and/or solutions. Discuss with the rest of the group where to place the decision/solution. You can assign a maximum time limit to each intervention.

5. Ask the crew to vote on the decisions and solutions that seem most realistic.

6. Commit the resources needed to start action on the most voted solution.

Keep your options open to test other solutions or run solutions in parallel.

What to look for

We look for alternative ways to address an issue, tapping into novel, emerging and existing practices. If we are in crisis, clear and complicated solutions may not be realistic or possible.

The formalised processes necessary for **clear** solutions may have been disrupted and we may not have the time to conduct the studies we need to solve **complicated** issues. But it is still worth a shot to keep these options on the map, in case conditions change.

A solution is **complex** if we cannot guarantee in advance its beneficial effects. We will need several experiments and monitoring systems to detect the option with the most beneficial impacts.

In **chaotic** solutions it's not just the impact to be unknown: the response itself is novel and it may fail badly. We will most likely try to use any available resource, creating the conditions for radical repurposing. Solutions that originate in this quadrant have high innovative potential but will be expensive and may fail at any time.

Complex

Place in this corner all the solutions/decisions for which several options are possible. Set up parallel, independent experiments and monitor responses.

Adjust protocols to assign beds and ventilators
Repurpose scuba masks using 3D printed parts

Complicated

Place in this corner all the solutions/decisions that require deeper analysis and the help of experts. Extrapolate from good practices.

Redesign ventilators to increase their capacity

Confused

Place the challenge here.



lack of
equipment

Use anything at hand to remedy the lack of equipment

Chaotic

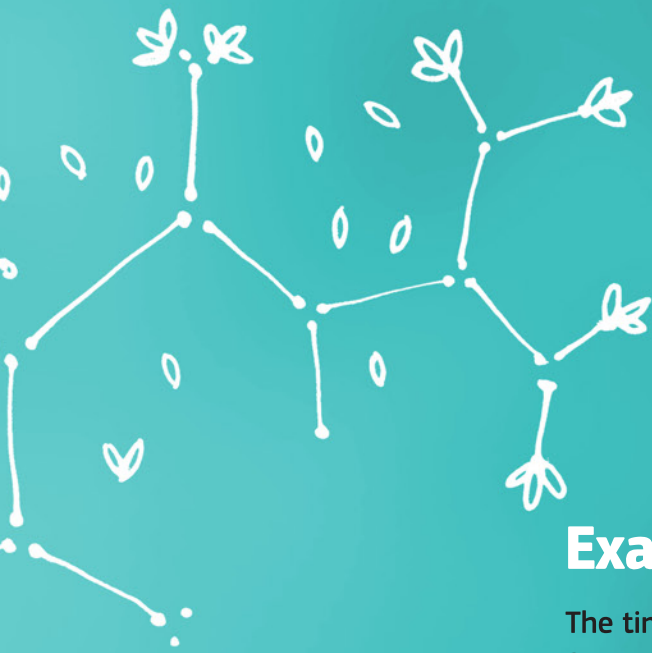
Place in this corner all the responses that need immediate action but have no clear outcome or look far-fetched. Exapt or re-purpose available resources.

Order more ventilators

Clear

Place in this corner all self-evident responses to the challenges. Use tried and true methods.





Exapt

The time for action has come. Yet, we have still too much uncertainty for an elaborate plan, we need to exapt.

Exaptation in evolutionary biology indicates the repurposing of an artifact, a trait or a module developed through natural selection. Feathers, for example, were initially intended as a form of communication before they were used for flight.

In organisational terms, exaptation indicates a process of radical repurposing of roles, processes, paradigms, values. It is a state of action that emerges after critically observing the present while (sometimes frantically) creating the structures and the conditions for the organisation to adapt.



Exapt Repurpose

The most efficient way to address crisis is through exaptation (radical repurposing) of available assets:

- use the material produced by the sensing networks to inform design briefs and missions;
- complement design briefs with a scan of current assets to spot what can be repurposed.

The repurposing process in itself will generate additional learnings. Integrate them with the knowledge provided by the sensing networks and build a base for transitioning out of crisis.

Exaptation in biology is the suggestion that a trait which has adapted in time for one function can, under different conditions, exapt for a different purpose. The idea itself is not new having been contemplated by Darwin. It has also been known as pre-adaptation but the idea that this implied some teleological process was in part responsible for Gould and Vrba coining the neologism in 1982. They use it to define two types of “cooptation”. Quoting them directly:

- a character, previously shaped by natural selection for a particular function (an adaptation), is coopted for a new use;
- a character whose origin cannot be ascribed to the direct action of natural selection (a nonadaptation) is coopted for a current use.

There is an implication that following exaptation the trait will then adapt to changing needs. The trait may not be fully suited to its new use and will therefore adapt as a secondary process.

The development was important in evolutionary biology as it explained how new traits could emerge more quickly than would be possible in a linear way. The often quoted example is the evolution of feathers for

temperature regulation and display, which were then repurposed for flight. Speculation as to how this happened includes fast running ground reptiles, where their feathers provided lift, or gliding between trees.

Once the exaptive shift is made we get sophisticated adaption, for example the “silencers” that evolved in the wings of owls and the use of feathers for trapping insects in other species.

Another example of exaptation is the cerebellum which adapted for fine grained manipulation of muscles linked to feeding, but then exapted to manage the sophistication of grammar in human language; something that would be too big a switch for an adaptive process.

This is not just a biological phenomena, there are many examples of **exaptation in industry and technology**.

IBM famously re-purposed an 18th century invention, punched cards, to create the ‘IBM Card’ with rectangular holes for easier patenting and machine readability which was one of the major factors giving it leadership in the early days of data processing.

Another very famous case occurred in 1945 when Percy Spencer, a Raytheon engineer noticed that a chocolate bar in his pocket started to melt in proximity to an active radar set. He realised that the short wave radiation arising from the cavity magnetron in the set, if confined to a metal box, would cook food. From this repurposing we get the micro-wave oven. The 1989 discovery of Viagra by Pfizer came from a programme looking for a treatment for heart-related chest pain. Realising the significance of a curious side effect created a blockbuster drug.

In organisations, radical repurposing is efficient in terms of time, reducing significantly time to market as well as to find solutions in a crisis. The ability to rapidly repurpose existing capability, knowledge and connectivity is also critical in crisis management and post-crisis recovery. It is strongly linked to the idea of entanglement in complexity science. At the right level of granularity, if we are able to see its potential, **combinations of existing knowledge with new or previously unarticulated needs** provide a significant opportunity. The growing understanding of this

and its application to social systems as well as physical products is critical to understanding innovation and post-crisis recovery.

The use of exaptation as a means of exploiting new opportunities generated by commoditisation or significant ecological shifts is a developing theory in management. The common saying is that we should interpret crisis as an opportunity to evolve and innovate. In crisis, old patterns are destroyed and spaces for novel practice open up; the ability to exploit those spaces ensures resilience and creates spaces for disruptive innovation.

Types of exaptation in organisations

In organisations, exaptation is a process that repurposes or redesigns existing resources. If the process is unexpected and forced by crisis and chaos, we call it **stress-based exaptation**; if it is a voluntary excursion in chaos, we call it **stimulated exaptation**. Finally, if it is a consolidated practice we call it **dispositional exaptation**.

We will discover more about these states in the next pages.

Stress-based exaptation

Extreme repurposing

Unexpected events brought us unintentionally into chaotic processes that can have catastrophic consequences on us and on our context: repurpose whatever at hand to stabilise the situation and, if possible, to limit catastrophic effects.

This corresponds to the area of accidental chaos in the Cynefin framework and it is the most likely to occur in crisis.

This happens naturally in any human system under conditions of stress. In a real crisis humans are very good at simply grabbing something (which can be an idea as well as a material object) and rapidly using it to fix (or throwing it to) an issue or problem.

This human inventiveness is something we can depend on but its results can be haphazardous and are not without casualties.

There is also the danger of the resulting pattern of solutions becoming entrained beyond usefulness. We can reduce the inevitable high failure rate by employing a crew that is very well trained in lateral thinking. This is the ideal job for the probing crew we set up earlier.

Extreme repurposing in COVID-19

In the first phases of the COVID-19 crisis we had several cases of radical repurposing initiated by informal groups of scientists, doctors, engineers and designers to cope with the shortage of medical items.

The successful examples of extreme repurposing often made it to national and international news. From the 3D printed

adaptor that repurposed a scuba diving mask to the 3D printed valve that duplicated the capacity of a respirator. Many businesses even stepped up and repurposed their manufacturing lines to produce items that were hard to source. As to be expected, some of the solutions broke existing legislative boundaries and, for example, challenged existing intellectual property and licensing rights.

In most cases, these radically innovative products were ideated and produced by the joint efforts of coordinated, informal networks that emerged spontaneously, supported by online connectivity.

Spontaneous networks also emerged to share practices and knowledge on online platforms.

It is worth noting how **no economic instrument or expected income** was sponsoring or supporting these purpose-driven movements and is most likely at the root of their success and diffusion.



Stimulated exaptation

Design radical innovation

Enter deliberately into chaos by removing conceptual boundaries and fixations; push the envelope, explore unreasonable ideas.

Reframe the problem space, challenge the norm. Use conceptual prototypes and boundary objects to understand the dispositions of the organisation and its beneficiaries.

This corresponds to the area of voluntary incursions in chaos, or the liminal area between chaos and complexity in the Cynefin framework.

Boundary objects

We create strong emotional bonds with objects that are part of our day to day routine when they connect us to special experiences, memories or people. They become the symbol of that experience, or person.

Other objects have deep impact on our emotions because they were passed on to us through generations and became material symbols of the values of our culture. Think of any religious object, for example.

Boundary objects challenge the symbolic meaning of an object by giving it an unexpected function or by de-contextualising it.

In extreme cases, the new function or the new context becomes an insult to the object and to ourselves. We went "too far".

In other cases, and these are the interesting ones, the object is placed within acceptable boundaries. It becomes a provocation but also an opportunity to reconsider normality.

Often, artists and designers use these boundary objects as statements. An example is one of the works of Curro Claret, a Spanish product designer, who proposed a church bench that can be easily disassembled and transformed into a bed for the homeless.

Other times, designers use boundary objects to understand people's dispositions towards certain scenarios and to inform their ideation processes.

This is a design approach that deeply questions fundamental paradigms: needs and knowledge are independently mapped and then entangled to create novel combinations. We need to think in concepts and metaphors, move the reflection from the immediate material to a level of abstract signification which opens us to more disruptive insights. In this sense, this is more a competence to be nurtured, discovered or imported in the organisation, rather than a set of methods and tools to adopt or apply.

Concrete experiences and anecdotes about the unfolding crisis are the raw material that feeds this design approach. They facilitate the generation of insights by enriching with thick data the design and decision making process, while keeping the reflection grounded on the present.

Experiences can be collected directly from our organisation and/or its beneficiaries and analysed with specialised software. Here, the level of abstraction is achieved by the signification framework which taps into the symbolic side of the stories.

In speculative design approaches, conceptual prototypes materialise in a tangible object or

organisational structure a potential but concrete experience that challenges our preconceptions, paradigms and assumptions. Their role is not to serve as functional prototypes of a concrete solution, they are a tool for exploring the invisible adjacent possible. They generate a "feedback experience" that is realistic enough to detect dispositions and to inspire further decisions. The results from this exercises of voluntary exaptation open the door to radical, unbounded innovation which can find fertile ground when crisis itself pushes us to questions our fundamental paradigms.

Stimulated exaptation in COVID-19

The COVID-19 crisis challenged our "normal" ways to understand work, entertainment, tourism, personal and social responsibility, etc. Some organisations and institutions transformed this unexpected incursion into chaos into a deliberate opportunity to (re)design their practices, for example embracing and experimenting with radical forms of teleworking.

Speculative design at the EU Policy Lab

In the picture, a group of students from the École Supérieure d'Art et Design de Saint-Étienne present boundary objects to Policy Officer at the European Commission to reflect on the future of farmers.

The prototypes were used to broaden the understanding of policy implications of potential technological, social and environmental weak signals.

The exercise was tutored by Rodolphe Dogniaux, design professor at the École Supérieure d'Art et Design de Saint-Étienne in cooperation with Jennifer Rudkin, Anne-Katrin Bock and Maciej Krzysztofowicz from the European Commission's EU Policy Lab.

More information on this project at:
<https://europa.eu/ljw69nk>



Dispositional exaptation

Design strategic interventions

Challenge the interactions between agents to inform strategic decisions. It is more effective than pre-determining an objective:

- use the material produced by the sensing networks to craft conceptual scaffoldings;
- use the scaffoldings to challenge roles, question the problem space while maintaining coherence;
- design harvesting methods and templates to collect knowledge and to inform strategic decisions.

This corresponds to the area of complexity in the Cynefin framework.

Conceptual scaffoldings

The most popular example of conceptual scaffoldings used in business are the so-called canvases. They are a combination of pre-defined empty spaces that function as enabling boundaries.

These templates help to collect the essential elements of a business and to think systematically to all its key contributors, beneficiaries, assets and liabilities. They are mostly used to inform abstract strategic thinking and concrete business plans.

A new generation of conceptual scaffoldings is part of the ongoing design research at the EU Policy Lab.

These are visual frameworks that position dimensions, agents, resources in a relational framework.

They are highly contextual and the position of each component encapsulates dense, specific knowledge captured in action research.

Like traditional canvases, they function as support for systematic and strategic thinking, but the emphasis on a visual approach unlocks possibilities to use them as dashboards or as synthetic snapshots of the status of complex entities.

They are mostly used in contexts where it is impossible to categorise or define agents according to one key dimension because of their organic, ecosystemic nature.

Here we create organisational structures and processes that naturally create novel associations. This is a key feature of strategic design, beyond the linear and de-contextualised application of "thinking" methods and tools to **create spaces for co-generation and shared sense-making**.

In these spaces, the exaptive role of design is to orchestrate multiple contributions in a coherent conversation, facilitate lateral thinking, harvest challenges, propose new actionable ideas and test them with proofs of concepts and prototypes.

In this process it is key to reduce blare, bluster and brawl. Conceptual scaffoldings, crafted choreographies and harvesting templates are of primary importance for this.

Choreographies ritualise the exchange of information and modulate the rhythm of the interventions giving space to individual contributions, group work and plenary sense making and alignment. **Harvesting templates** anchor conversations in actionable outputs., while **scaffoldings** help to maintain focus but keep the door open to weaving several perspectives.

Tree methods and approaches create the pre-

conditions for strategic design:

Social network stimulation allows a generative use of informal networks. It ensures that everyone in an organisation (and ideally its proximate networks) is within two/three degrees of separation based on a trusted common set of experiences. With a densely created network and proper design facilitation, ideas and associations will emerge organically.

Triads are groups of three people from radically different backgrounds with no prior interaction. They are kept together by purpose and by well crafted choreographies which ritualise the exchange of knowledge and create trans-disciplinary possibilities. Harvesting templates catalyse the creation of actionable knowledge.

Staged, highly structured events allow experts from many different backgrounds to interact with people who experience first hand the various current issues and problems. A series of action-based research experiments take problems and knowledge assets into easily understood 'grains' which are then associated to create novel ideas.

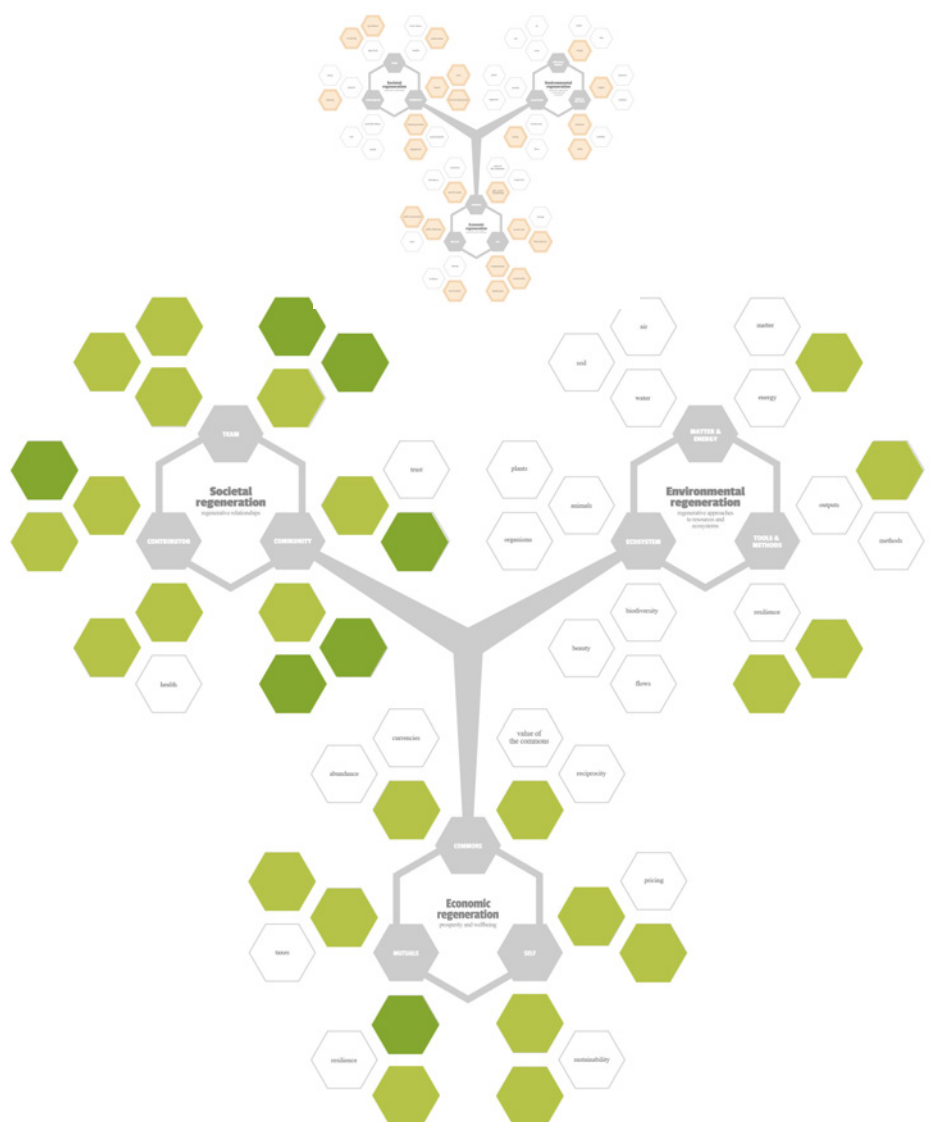
Scaffolding at the EU Policy Lab

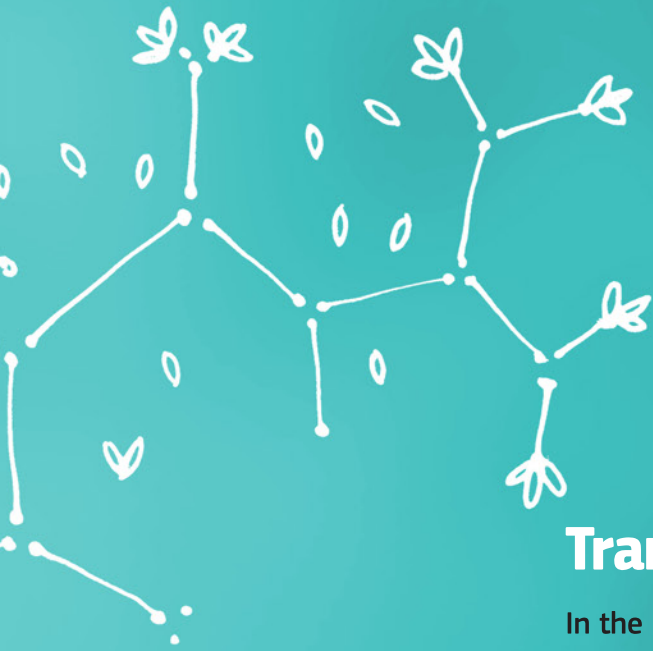
In the picture, a "next generation" canvas is used as scaffolding to identify and visually represent the identity of a social economy activity.

Social economy in Europe lacks a comprehensive definition and the intention here is to maintain a broad perspective to facilitate the development of inclusive policies. The team, composed by practitioners, designers and policy makers, opted to use a visual scaffolding structured in triads that provides an integrated view of 54 key dimensions.

This approach allows us to immediately identify a company's priorities across the triple bottom line of social, environmental and economic regeneration (green triad) and compare it, for example, with local and regional priorities (red triad).

More information on this project at:
<https://europa.eu/jc88ph>





Transcend

In the path toward transcending the crisis, most of our initial structure may have dramatically changed or disappeared altogether.

It is time to ritualise and consolidate change, avoiding the temptation to return to practices that are now clearly obsolete.

But is it the end?



Manage cadence and control

At this point we should have several units operating in ways that are novel for the organisation:

- **maintain cadence and control.** If we lose coherence, we may quickly spiral back into chaos;
- identify what novel activity should be part of the new normal and what should be reverted to previous practices;
- ritualise the learnings, especially those that originate from failures, to ensure that we are ready for the next crisis.

Cadence

Cadence matters more than velocity if we seek stability and endurance.

In management, review cycles are what create cadence. During conditions of high stability, cadence can be slow and the subjects reviewed are usually quite repetitive. In a crisis the pace will be fast, but there needs to be a rhythm to it, commonly understood between all actors. Priorities can be selected ad-hoc within small, tightly focused teams who can expect or enforce compliance.

Daily or quasi-daily cycles in small teams serve the purpose of addressing urgency and uncertainty, when a changing context generates constant shifts in priorities. A small number of participants allows more effective decision making, and all need to be present.

Weekly feedback cycles help to align several functions and will replace various forms of written reporting. Representatives of all functions should participate with a fairly relaxed approach to who turns up. Absent members will need to be kept up to speed so we need to evaluate how costly that is.

The ability to shift to **bi-weekly cycles**

indicates that we have reached a certain level of stability. We are reducing the pace while activities keep moving fast. The ideal is to increase velocity while reducing cadence of review, which reduces the energy cost of management.

Regardless of its frequency, the critical thing is to **find a rhythm which allows for stability**. It is also crucial not to overlap uncoordinated sessions, as the punctuated information flows could add unmanageable noise or generate lack of awareness. If we consider this in terms of flow we are creating a cadence that prevents the flow from becoming turbulent. In a crisis, and recovery of a crisis, all key actors need to be aware of decisions and the reasons for those decisions, there isn't time to read emails, check a project management Kanban board or similar: we just need to know. Information management is key and can't be left to chance or mediated reports.

At Cognitive Edge, the management of cadence is helping to advance a major software release, while at the EU Policy Lab it is helping to provide fast response to very sensitive, high profile projects.

The size of a unit (a short hand that includes

teams, crews, hierarchies and networks) has some natural limits; the Cynefin diagram at page 60 shows team size, membership criteria and temporality.

We need to be aware that crisis management teams tend to get very close to each other during the crisis itself. Peer support and extended walk-the-floor breaks are among the techniques we can use to avoid that they get completely isolated from reality. More importantly when the crisis is over the team needs to disband and that change has to be ritualised. Knowing when we have crossed the boundary from adaptation to recovery is important and it requires a rite of passage.

Control

Crisis control should be relaxed. Most likely, there will be no loss of quality as the overall perception of risk changes. At the start of COVID in the UK authorisation for critical public projects were granted in days or hours where before it would have taken months.

The fundamental steps of the control processes were still there but their use was accelerated and unnecessary steps removed. As the crisis receded, two things happened: grass roots romanticism wanted to continue

with the freedom provided, while those who would carry the can for the risk started to realise the potential implications of post-crisis audit and reverted to business as usual. Now both of these responses are wrong but the pendulum swing between crisis-induced freedom and the reimposition of bureaucratic controls is inevitable unless we address it.

Three devices come to help.

Key actors performing **continuous journaling**: realtime feedback loops and human sensor networks in which observers journal changes in process and carry out micro risk assessments. This is useful for operational management, weak signal detection and the like. Post-crisis, journaling gives an evidence base to work out what can be changed permanently and what should be returned to normal. We build expertise in this during the crisis with peer to peer narrative learning, for example.

Teams using the evidence from the journaling and other information sources to **look at reform** before we get too far away from the crisis. For example five or six crews each formed by an auditor, a frontline worker and a

manager work on the problem in parallel to spot reform possibilities or to experiment with safe-to fail changes.

Identify the **human elements** involved in quality decision making. Some people are better at it than others, but it can also be a professional issue. For example there is a significant difference between hospitals run by professional managers and those run by former doctors trained in management. The latter have a broader knowledge of the implications of decisions and understand that it is a context specific matter.

A part of our change may be to define the boundary conditions within which autonomy can be permitted. That includes rules about expectations and heuristics to come into operation when rules are broken.

Transcend

Ritualise learning

We learn more from failures than success, and the learnings are more reliable if lessons are recorded and formalised when they are still fresh:

- simulate failures as a method to increase resilience;
- de-personalise failure and avoid blame;
- start a mass engagement process to ritualise learning.

Games have always had an adult purpose, from political simulation to war games. They provide a safe learning environment to test strategies and tactics with immediate feedback. Two examples will show how games can prepare us for crisis and train us to learn from our failures.

Anthro-simulation

Anthro-simulation involves human game masters controlling an eco-system where whatever we do, we fail. We create parallel teams in an open space who are presented with a (crisis) situation for which they have to complete a situational assessment and come up with a next steps action plan.

Each work area has microphones so the game masters can hear the conversation, for two reasons: to monitor how the decisions are being made and to allow them to feed disruptive data in real-time.

After some time, which depends on the urgency that we want to give to the exercise, the teams are given a one hour break. When they come back they discover that whatever they did turns out to be a disaster. This is easily done by picking up a weak signal that they missed and extrapolating it. The cycle is

repeated three times and after the second time everyone starts to realise that they are doomed.

Because it is happening in parallel to other teams this is not personal and by the end of the process, the amount of data being scanned before a decision increases significantly. **Failure engenders more learning than success.** Throughout the process all team members and observers journal their experience into a sense-making database. That creates a narrative learning environment of simulation failures that can be used as a knowledge repository.

Archetypes

Linked to the idea of games is the displacement of confession into fictional story forms including the use of archetypes.

Archetypal story forms historically have been used to distribute learning of failure without the need to admit personal. An example are the stories of the Mullah Nasrudin, the wise fool. In societies familiar with such stories, if we do something foolish we create a story about how the Mullah did it, and it then spreads without attribution of blame. In a lessons learned environment it is a powerful

and easy-to-use technique, and more ethical than exhorting people to be open about failure. Hindsight often points to something we could have done differently. By displacing failures onto archetypal characters we effectively allow people to use an actual experience, a synthesis of experiences, or a just-so story to convey learning to the current and following generations. Lessons learned is not a drains up search for the truth, it is about creating learning, which can come from fiction as much as from fact.

Learning from crisis

So how does all of this link to our theme of post-crisis recovery? Well first and foremost is that the trauma of the crisis will have generated **multiple learning opportunities** and we need to formalise them before they fade over time. So in our four-stage Assess-Adapt-Exapt-Transcend we need at the end to focus on learning, prepare for the next crisis, and ritualise that learning as a means of understanding that we have moved on. The initiation of a highly visible and mass engagement learning process is a way of signaling the end of a crisis and the need to move on.

Seven key possible uses of narratives here:

We **save simulation stories with real-time journaling**. Narrative databases disclose complex patterns of meaning over time and allow serendipitous encounters with material we didn't expect to find.

We give our workforce access to the stories and **use narrative clusters to stimulate new stories** about how we could have done better. We also save those new stories and we link them to their originating material. The material can be used to review the rules we had put in place and to stimulate planning based on micro scenarios.

We **create scenarios from the anthro-simulation games** for key players (or ideally all the workforce) allowing the learning to be embedded while the need to learn is still front and centre. We don't wait until everyone has forgotten what happened!

We **combine the situational stories with a narrative audit of existing capabilities and assets** to suggest ways in which we can radically repurpose things we are already competent in, for novel purpose. This will also provide opportunities to gain a competitive advantage of the novel situation that a post-

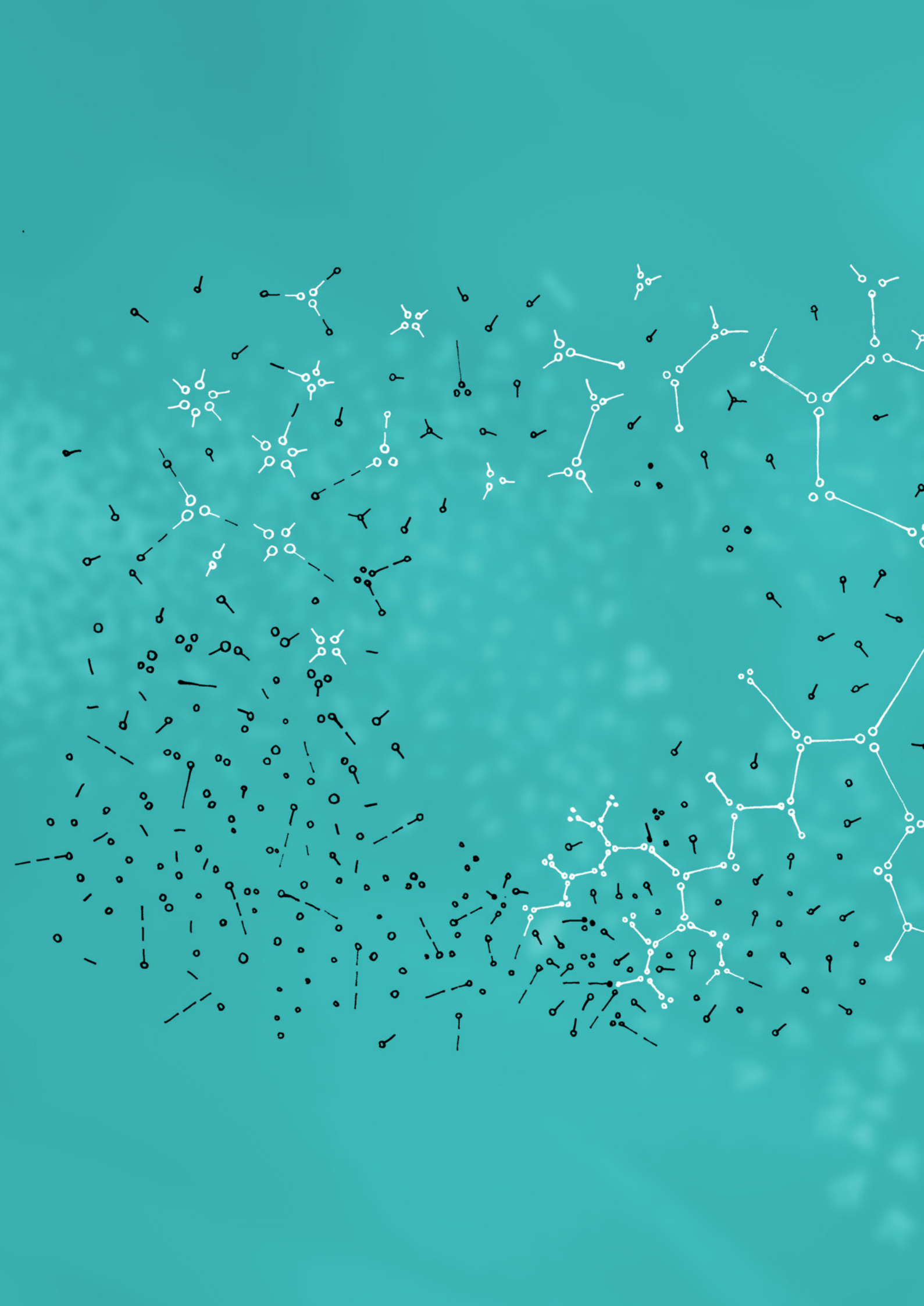
crisis always brings. The artifacts of the crisis management process become a part of the strategic and tactical process thereafter.

The **widest possible engagement is important** and that can extend to customers, citizens, retired employees as well as potential recruits still in college. The more perspectives we get, the better.

The material thus gathered creates **training datasets** that will allow anticipatory triggers for early signs of a future crisis; this is also known as weak signal detection and includes warning of excessive constraints which could bring our organisation to collapse into chaos.

Micro-narratives and mass participation provide a more effective source of material for effective internal and external communication than carefully formulated statements. Similar control, but a lot more effective.

The process of managing and exiting from a crisis becomes now a process of creating a sense-making infra-structure that will sustain the organisation into the future.





Cynefin

The practices and competences contained in this booklet are inspired by and reinforce a conceptual framework designed to manage anthro-complexity, or complexity in human systems.

The Cynefin framework

Cynefin is a decision support framework. It is a way of determining what method or approach we should adopt while critically assessing when we should change it.

It is based on the principle of bounded applicability: there are few if any context-free solutions but many valid context-specific ones.

In crisis, the framework helps to generate a transitional path from a state of puzzlement, or aporia, to a state of adaptive reaction and finally to transcend, innovate and learn.

Cynefin is a key framework in what is known as naturalising sensemaking. The term naturalising relates to the use of natural science. Sense-making (with a hyphen) is defined as “how do we make sense of the world so we can act in it”. Cynefin is also part of a body of work looking at the correct balance between deductive, inductive and abductive sensemaking.

The essence of the framework can be summarised as follows;

At its heart there are three primary domains: *order*, *complexity* and *chaos* **defined by the type of constraint**, or absence thereof. *Order* is constrained to the point where future outcomes are predictable as long as the constraints can be sustained, *Chaos* is the absence of effective constraint while *complex* is uncertain but has **enabling constraints**, many levels of entanglement that make it dispositional in nature with no linear material causality.

Most organisations are by nature complex adaptive systems where needs and requirements entangle with identities, cultural practices, personal preferences and values,

challenging and interpreting even the most strict rules and procedures to give result to unpredictable outcomes.

The shifts between the primary domains are all phase shifts and need energy to happen. The best metaphor in science is **latent heat**: energy is required to achieve the phase shift from liquid to gas even though the temperature does not change.

In organisations, phase shifts translate to culture change: they need energy which is not used to expand or perform but to dramatically change the nature of internal relationships.

To accommodate the disconnect between reality, perception and knowledge in human systems, *order* in Cynefin is divided into *clear* and *complicated*. In *clear* the relationship between cause and effect is self-evident and clear to any reasonable person; constraints are rigid or fixed. In *complicated* cause and effect exist but it requires expertise or analysis to discover it; constraints are governing, giving confidence in the boundary of expertise.

Further we have the *confused* domain, which is the state of not knowing which domain we are in and is frequently, but wrongly (sic)

confused with *chaos*. This is the where we start from in most crises: a confused state where the lines of action are not certain. *Confused* is appreciated as A/C (*aporetic/confused*) elaborated more in the next section.

The "transitional" or **liminal line** in Cynefin indicates possible paths of transition among domains. It is open at the top, closed at the bottom and intersects all domains, except *clear*. The boundary between *clear* and *chaotic* is a **catastrophic fold**, or cliff; a collapse where the liminality in *clear* is not visible and it is all too easy to walk blindly off the cliff. In organisational terms, this relates to an excessive confidence in the applicability of existing rigid procedures and constraints which can easily bring to chaos when crisis occur.

The line creates **liminal states** in *complex* (still uncertain but transiting to *complicated*), *chaos* (the deliberate removal of effective constraints for decision support and/or innovation), *complicated* (where the analysis method or type of expertise is in question) and *confusion* itself which is the area of aporia. To be unknowingly in the *confused* domain is not

advisable and it is adjacent to the catastrophic fold for a reason. To be in a state of confusion authentically, with knowledge of the state means that **aporia** can be created to exit into any domain other than *clear*.

There are different types of practice in each of the Cynefin domains and liminal areas. In the *complex* domain practice is **exaptive**, or focused on radical re-purposing of existing capability. In the *complicated* domain we apply **good practice**, in *clear* we have the only legitimate application of **best practice**.

In the liminal area between *complex* and *complicated* practice is **iterative** in nature, seeking to establish good practice through a phase shift and this will require energy.

In *chaos* practice is generally **novel**, either by accident, or in the liminal area by design. In the liminal area of *confused*, practice is **aporetic**, the deliberate creation of paradox and puzzlement to get people to think differently. No type of practice is universal, the summary here is the main focus for action.

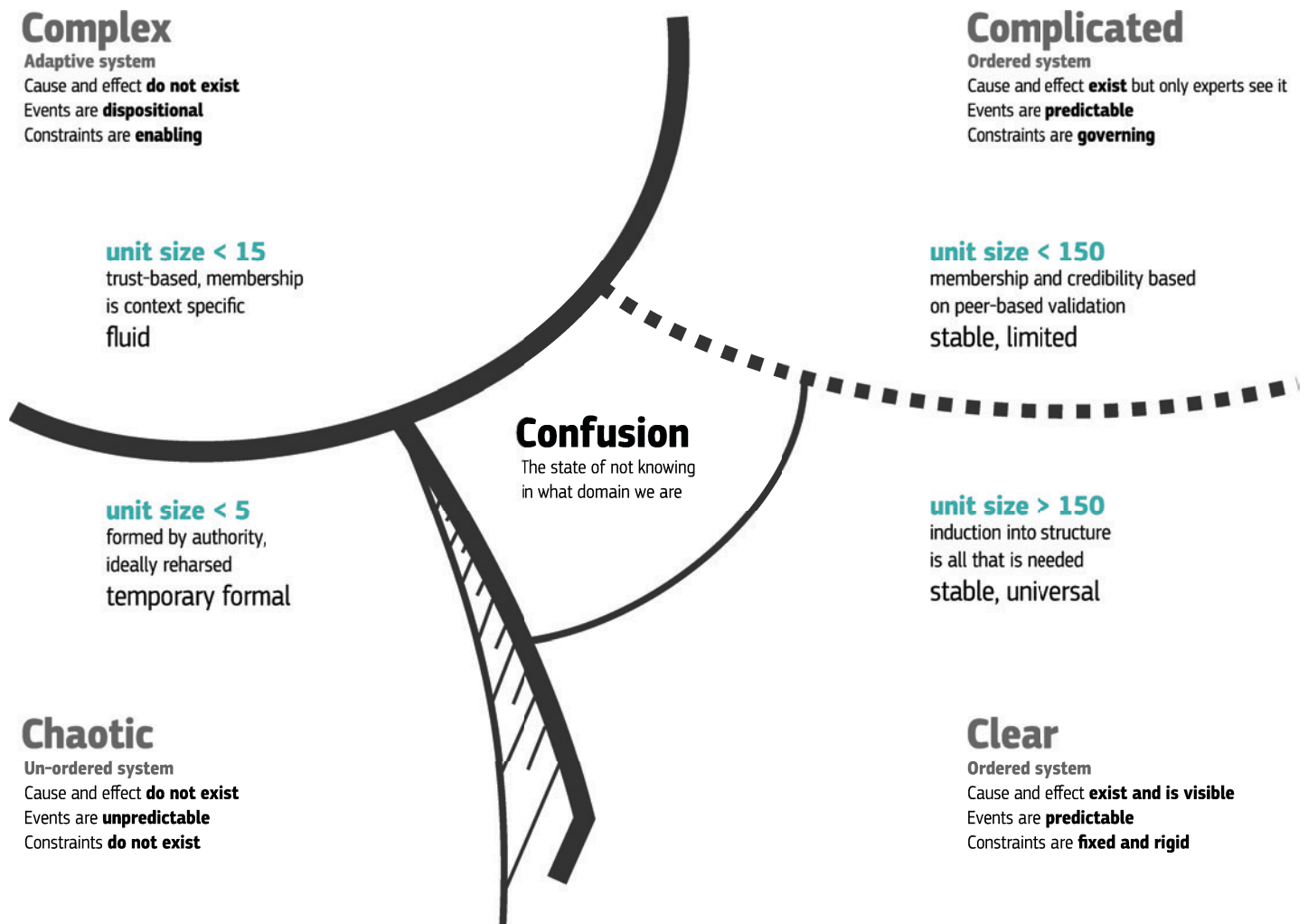
Cynefin is at its heart a **decision support framework** that is based on the principle of bounded applicability: there are few if any

context free solutions but many valid context specific ones. As such Cynefin is a framework not a method, it is a way of determining what method or approach we should adopt and critically when we should change it.

Movement between domains can take many forms. The most stable is a **constant iteration between complex and complicated** with some material being consigned to *clear* when there is sufficient stability to warrant it and the shift is low risk. Occasionally there is a need to dip into the **aporetic liminal area** from *complicated* if pattern entrainment has set in. The aporetic liminal area is the normal target for an exit from involuntary *chaos*. There is also a dynamic which constantly moves from *complexity* through all liminal domains and then back again.

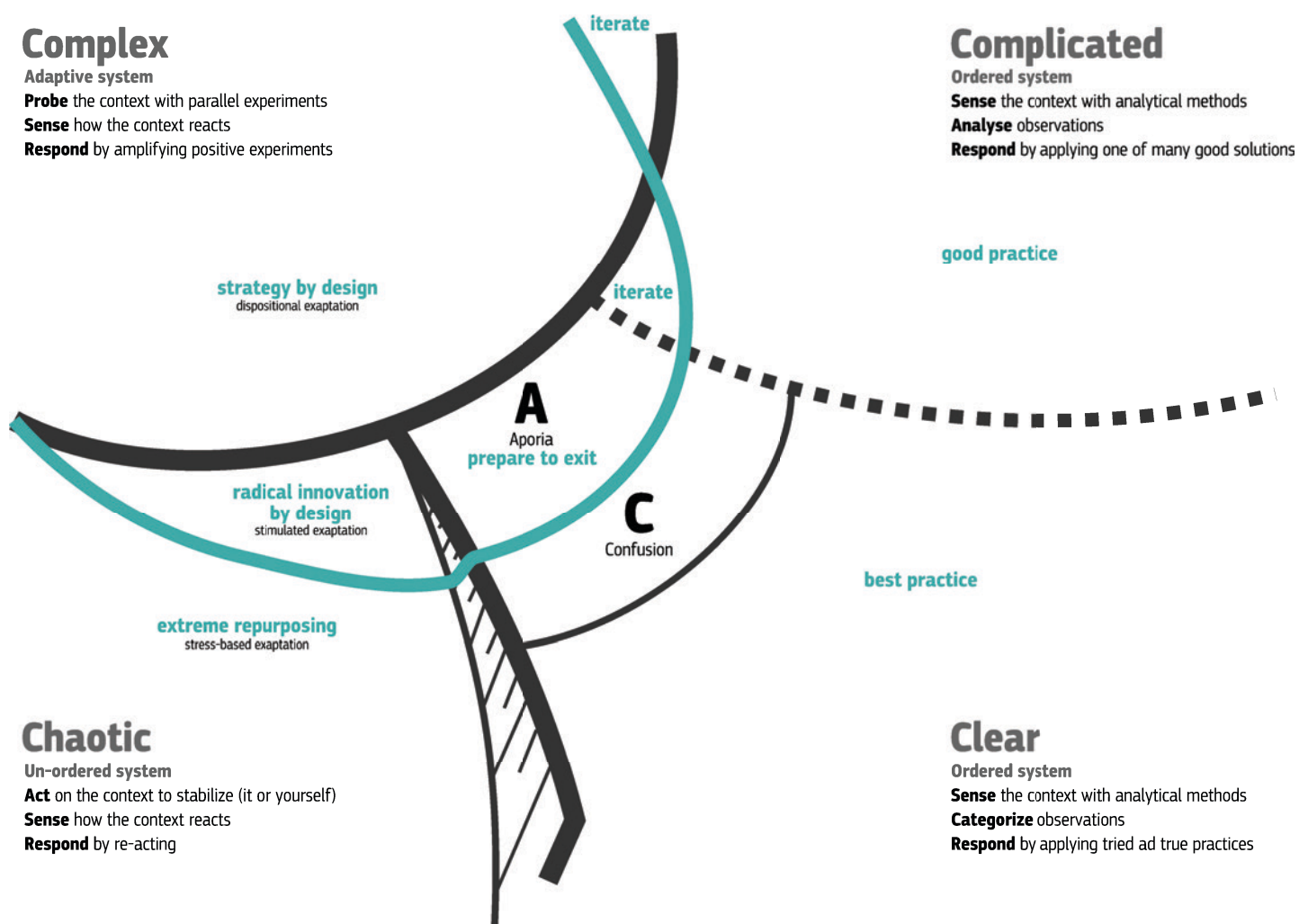
More on the Cynefin framework at:
youtube.com/watch?v=N7oz366X0-8





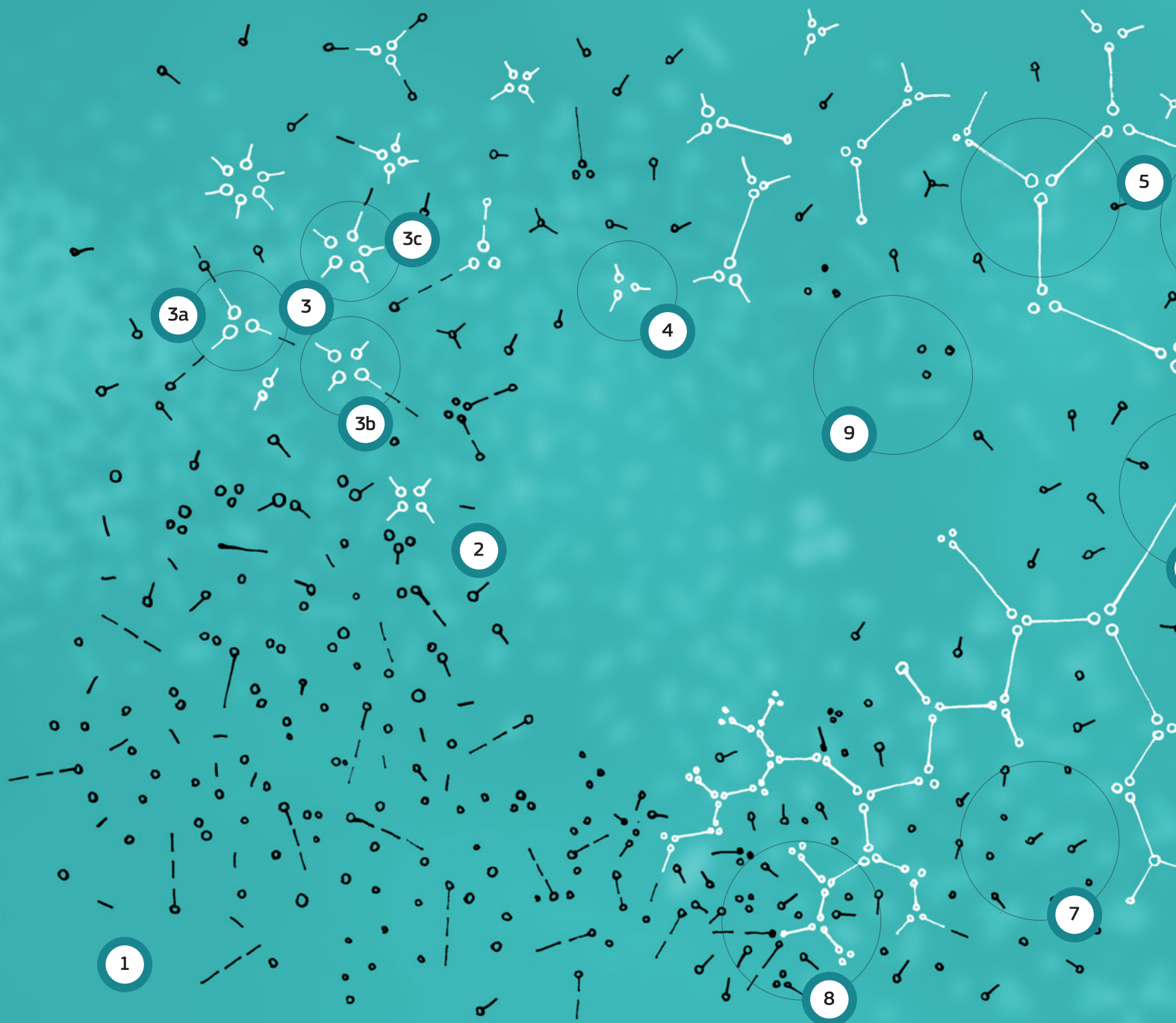
Four domains

This field book suggests that there are four key domains to consider when addressing challenges in times of crisis, each requiring different types of analysis, response and resource development.



Four stages

In crisis, we inevitably start in a state of confusion but the responses to the events that are unfolding will have to consider all four systems. Even during a crisis not everything is chaos and many responses may be self-evident.



The Cynefin framework in a flow

A free-flow, organic interpretation of the Cynefin framework



1. Chaos as the place with no constraints nor boundaries
2. Serendipitous encounters and dark constraints give light to the first stable ideas.
3. Complexity as the place where several ideas interact in conversations that generate scaffoldings. We can observe agents interacting according to three paradigms: the triad (**3a**), the square (**3b**), the pentagon (**3c**).
4. A paradigm (the triad in this case) becomes successful and creates a filter that, from now on, will condition and influence the creation of new structures.
5. Complication as the place where the paradigm is interpreted into several possible outputs, all respecting and reinforcing the triad.
6. Clarity, where a set of rules starts to dominate and becomes the only allowed structure.
7. Any living system has agents that still permeate the space but don't fit in the mainstream narrative and structures.
8. The more the structure self-replicates, the more it acts as a rigid, impermeable boundary. The increasing pressure on the structure will end up breaking it catastrophically. The system will fall back into chaos.
9. Keeping the structure flexible and consciously removing some of the more fixed and rigid boundaries allows us to drift back into complexity and rediscuss the paradigm.

Endnote

We can succeed only by concert. It is not "can any of us imagine better?" but, "can we all do better?" The dogmas of the quiet past are inadequate to the stormy present. The occasion is piled high with difficulty and we must rise with the occasion. As our case is new, we must think anew and act anew.

Abraham Lincoln

Annual Message to Congress

December 1st 1862

Cynefin

Cynefin (pronounced cun-ev-in) is a Welsh word with no direct equivalent in English. As a noun it is translated as habitat, as an adjective acquainted or familiar, but dictionary definitions fail to do it justice. A better, and more poetic, definition comes from the introduction to a collection of paintings by Kyffin Williams, an artist whose use of oils creates a new awareness of the mountains of his native land and their relationship to the spirituality of its people: "It describes that relationship: the place of your birth and of your upbringing, the environment in which you live and to which you are naturally acclimatised." (Sinclair 1998). It differs from the Japanese concept of Ba, which is a "shared space for emerging relationships" (Nonaka & Konno 1998) in that it links a community into its shared history – or histories – in a way that paradoxically both limits the perception of that community while enabling an instinctive and intuitive ability to adapt to conditions of profound uncertainty. In general, if a community is not physically, temporally and spiritually rooted, then it is alienated from its environment and will focus on survival rather than creativity and collaboration.

Dave Snowden

Cynefin a Sense of Time and Place

Knowledge Horizons

The quote from Lincoln used above is one of his most famous and featured in Composer Copeland's *American Portrait*. The speech was made one month before signing the Emancipation Proclamation.

It contains some key messages for anyone seeking to recover from a crisis at any level: *phia* (wisdom) and *prognosis* (foresight), contrasting theoretical knowledge with that obtained through practice, not to privilege one or the other but to require both.

The call is to both *think* and to *act* anew.

Any crisis involves a considerable focus on action, but reflection is also needed and that needs to be distributed into the wider community. In the Transcend section of this handbook we identified a series of short and long term actions that create a process of reflection within those involved in the crisis.

The need to **act in concert**, to work together, is key but that working together recognises what, from a complexity science perspective, we would call requisite diversity. We don't want to homogenise but to **create coherent heterogeneity**, or the ability to come together in common need for common purpose without the loss of what made us distinctive

in the first place. At a very prosaic level think how fierce rivalry between local sports clubs can be forgotten in the context of a national team.

It is **not about imagining a better future**, although there is nothing wrong in that per se, **but it is about doing better**. Far too many change initiatives in organisations and in governments end up with idealistic statements about a desired future state which inevitably end up in disappointment.

A vision of a future state should provide a sense of direction but not a deterministic goal.

Once we understand complexity we know that starting journeys with a sense of direction leaves us more open to discovering novelty on those journeys, opportunities and threats that we could not have imagined in advance.

Key is that we create an organisation that has high levels of resilience, defined here as the ability to survive with continuity of identity over time. This is a quality of systems that come through failure stronger (called anti-fragile systems). However failure is not the only way in which resilience can be built. One way to understand this is to think

about the difference between a sea wall and a salt marsh.

The sea wall is robust, it is a clear, rigid boundary that holds back the tides. It drains the landward side and allows us to use it productively. All is well and good until the design conditions are exceeded and the wall breaks catastrophically. A salt marsh in contrast is less efficient in its use of land but absorbs multiple indications flexing and changing over time. The landscape may change but the identity is the same. When the salt-marsh is saturated critically, it does not create a catastrophic release as is the case when the sea wall breaks.

During conditions of uncertainty we need more salt-marshes and fewer sea walls; the idea of surviving with continuity of identity over time is key. We are changed by context but we are not constantly starting afresh. The sea wall is highly efficient, the salt-marsh is however more effective in extreme conditions. A focus on efficiency has high utility to the expense of variety and redundancy in the system and in consequence reduced adaptive capacity. A balance is a key part of leadership. Of course we may not be dealing with a single

crisis, but a cascade or overlapping series of crises each of which can damage resilience.

But we may increase resilience if people can accept the often radical sacrifices needed by the current situation as a mean to also reduce the impact of a crisis yet to come.

The COVID crisis for example comes as the awareness of global warming is growing, albeit later than any scientists wanted. The sacrifices made for containing COVID demonstrate what is possible - it is the responsibility of leadership to make the links and not allow a return to what was considered normal.

While a crisis offers a real opportunity to make radical change, such a desire needs to be treated with a healthy dose of pragmatic realism. Behaviour in a crisis cannot sustain itself for long after the crisis, or even within it if it goes on for too long.

Sudden novelty means that humans will change behaviour in unexpected ways, but only for a period.

To take an example, in the COVID crisis governments world wide radically reduced or removed bureaucracy to allow rapid decision making. That reduction is not sustainable, but

neither should we return to prior practice.

Operational people have learnt that things can be done more effectively and faster but we should not seek to remove bureaucracy, rather to modify it and adapt. Instead of radical swings of the pendulum we need to allow a new stable position to emerge.

The realisation that **rules cannot cover all possible future states** is a common aspect of emerging from a crisis but few put it into action. One approach is to **define rules and when rules can be broken, but have a control process** when this is necessary. The US Marines have a simple policy. When the battlefield plan breaks down, soldiers follow three simple, easily memorable heuristics or rules of thumb: capture the high ground; stay in touch; keep moving. Such heuristics are measurable and provide a control framework while allowing flexibility of response in rapidly changing circumstances.

It mimics what we know about animal behaviour; the flocking behaviour of birds can also be simulated using three simple rules: follow the next bird, match speed, avoid collision. Add a further rule about leadership swapping on a time interval and we get the V-

shape of geese flying. **Simple rules give rise to complex behaviour which can be managed and monitored in consequence.**

Napoleon's famous order march to the sound of the guns provided a self organising principle, but also one in which multiple commanders could predict the behaviour of others without the need for direct orders or communication lags. If all the other active agents are using a common set of heuristics then the system as a whole can align around a common purpose much faster.

It is also important to emphasise **the importance of boundaries and boundary crossing** for human decisions.

As a species we are not good at gradients, we tend to settle where we are most comfortable.

The boundary transition between rules and heuristics is a boundary between complicated and complex in Cynefin terms and the move across it needs to be ritualised to ensure the behaviour change.

Boundary rituals are important not just for the local decision maker, but for the wider community in which their action will be seen and judged.

Capturing, codifying and linking the propagation of heuristics to teaching stories is a key way in which organisations can create resilience post crisis.

This also links into another aspect of military learning that is insufficiently used in government and commercial organisations alike, namely the role of practice. Military units practice more than they fight. In the context of non-military organisations, while practice is possible, it is not viable at military levels. So instead we have to create operational capability and embedded networks that embody aspects of day to day organisation whose nature and use can rapidly be triggered as is into crisis management. This is a design issue and one that is not difficult to do, certainly easier to put in place in the immediate aftermath of a crisis when people can see the need.

So for decision support we talk about creating networks for ordinary purposes that can be activated for extraordinary needs. The section on how to create a human sensor network outlines some principles of how to do this. Having multiple perspectives available in real time to decision makers is key

to decision making in a crisis but also has utility on a day to day basis.

Finally one key aspect of understanding **complexity is that it is path dependent**, we cannot forget our history even if we wish to transcend it. The basic framing of the word Cynefin in Welsh is a sense of living in a flow of meaning. It has been compared to the German Heimat and the Maori turangawaewae, meaning a place to stand. But the Welsh equivalent of those words, which have a sense of looking to a place is hiaeth, a feeling of longing for a home that ever was and a bond which persists over time. Cynefin as a concept recognises the nature of the past, and does not seek to return to it, but to continue, changed by it.

Recognising that we are formed by our multiple pasts, but also by our imagined futures contains the idea of transcending through learning and education. In the aftermath of a crisis we have, almost uniquely a shared immediate past that can trigger change but we need to seize the day and avoid the danger of just falling back to the practices which allowed the crisis to emerge in the first place. Here we have to be very careful

to, in the words of Lincoln combine words with actions. A final quote from T S Eliot summarises this well:

"Nothing pleases people more than to go on thinking what they have always thought, and at the same time imagine that they are thinking something new and daring: it combines the advantage of security and the delight of adventure."

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