Seeing through Complexity



Emiliano Soldi

@AgileTriathlete #AgileTalks

https://www.EmilianoSoldi.it

AGILE TALKS

February 23rd 2021

In 1941 U.S. was preparing to enter World War II

Two new technologies appeared to offer crucial advantage to the U.S. Navy since its entrance into the conflict



By USN - U.S. Navy Naval Aviation News March 1946 [1], Public Domain,

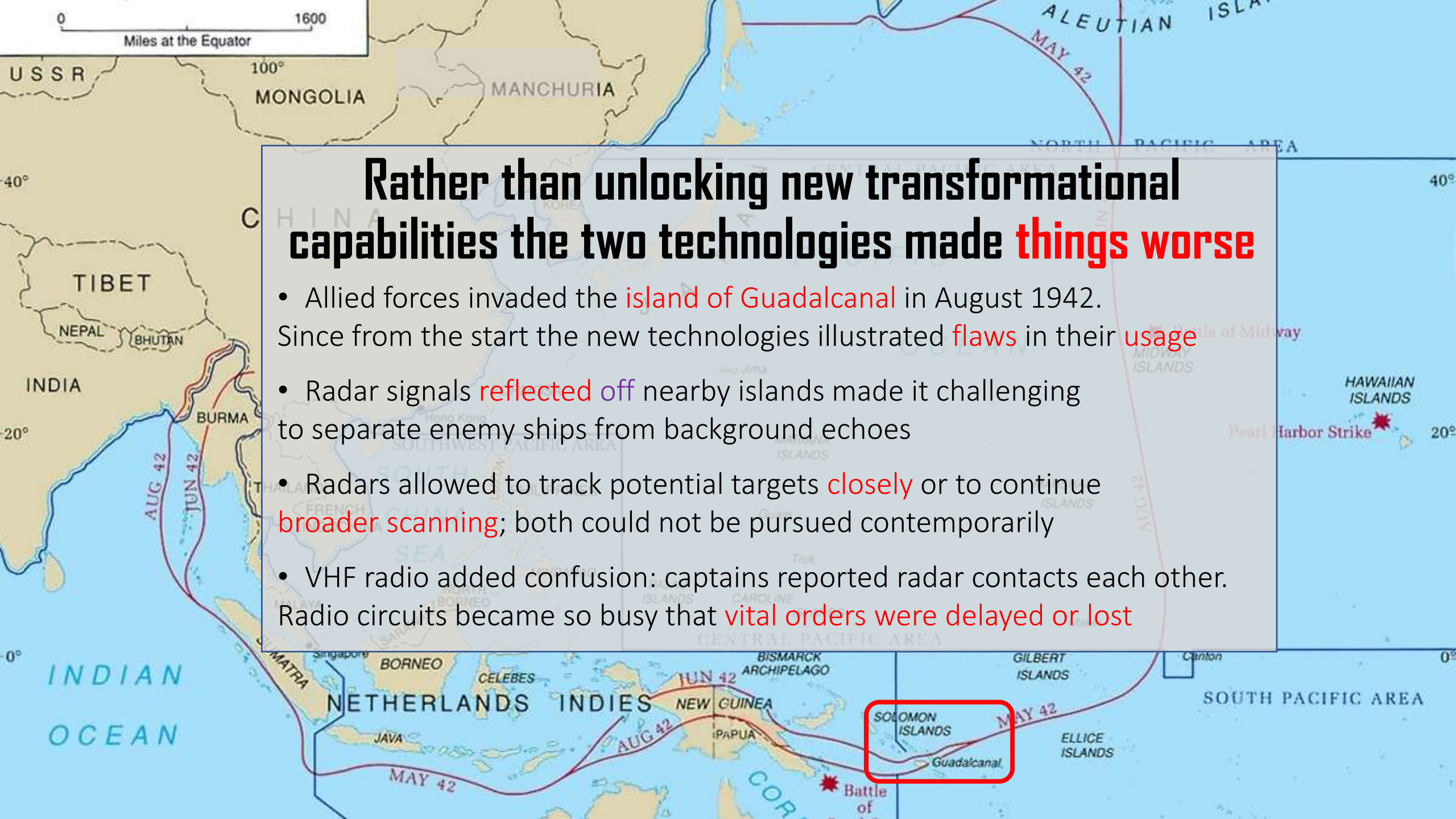
The radar gave the remarkable ability to detect approaching ships and planes quite in advance respect to the past



By George Shuklin - Own work, CC BY-SA 1.0,

VHF radio (very high frequency) allowed to communicate between ships in real-time and without giving their position away

These two new technologies had the potential to allow senior naval officers to rapidly develop situational awareness and adaptiveness in combat situations and coordinate the ships with unprecedent focus and clarity



Rather than unlocking new transformational capabilities the two technologies made things worse

- Allied forces invaded the island of Guadalcanal in August 1942.

Since from the start the new technologies illustrated flaws in their usage

- Radar signals reflected off nearby islands made it challenging to separate enemy ships from background echoes
- Radars allowed to track potential targets closely or to continue broader scanning; both could not be pursued contemporarily
- VHF radio added confusion: captains reported radar contacts each other. Radio circuits became so busy that vital orders were delayed or lost

Battle fields were inundated with unprecedent levels of un-correlated information…

- Admiral Chester W. Nimitz was appointed by president Roosvelt as Pacific Fleet Lead
- Nimitz was recognized as one of the most inclined US Navy leaders in fostering the initiative of his subordinates over command and control
- He speculated that new structures were needed aboard each ship to process information more effectively
- He did not mandate any orders.

He indeed formulated a compelling and clear vision:

"Maximum combat efficiency by any ships and task organizations, can be attained through full utilization of available sources of combat intelligence. In this, Radar and VHF radio shall be used to the best effectiveness."

- While not specifying anything regarding how to do it.



Admiral Chester W. Nimitz

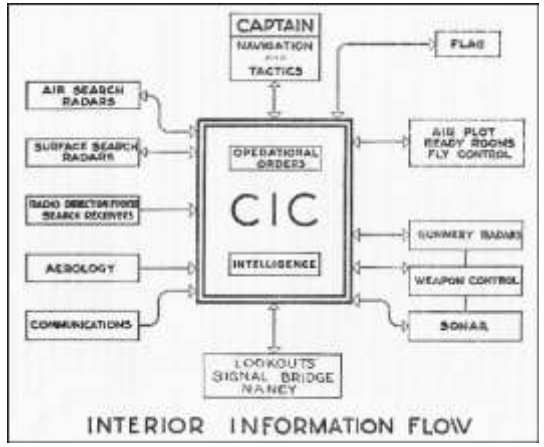
Each ship self-organized and made several parallel experiments

Combat Information Center (CIC) emerged from experimentation, self-organization and close collaboration

- ✓ A co-located multi-disciplinary team of specialist was formed
- ✓ Each CIC maintained a master plot of all available information, to be evaluated to quickly make sense of it
- ✓ That open information allowed captains to better interpret the situation at hand, letting them confident to experiment
- ✓ CIC went far beyond an information system, becoming a system of distributed cognition



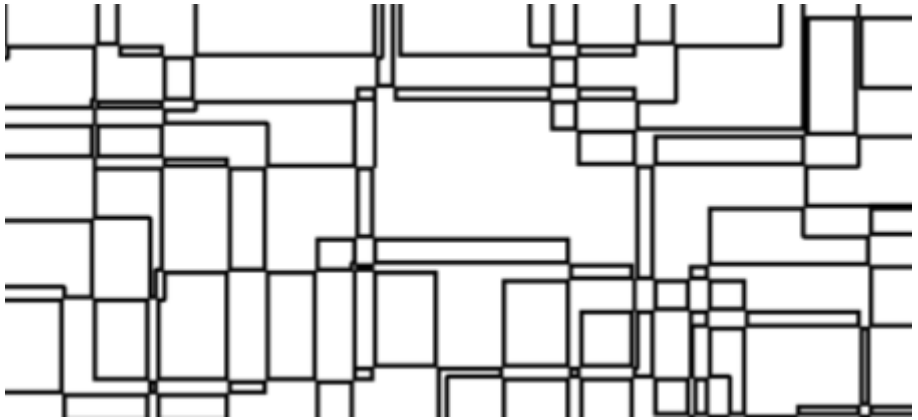


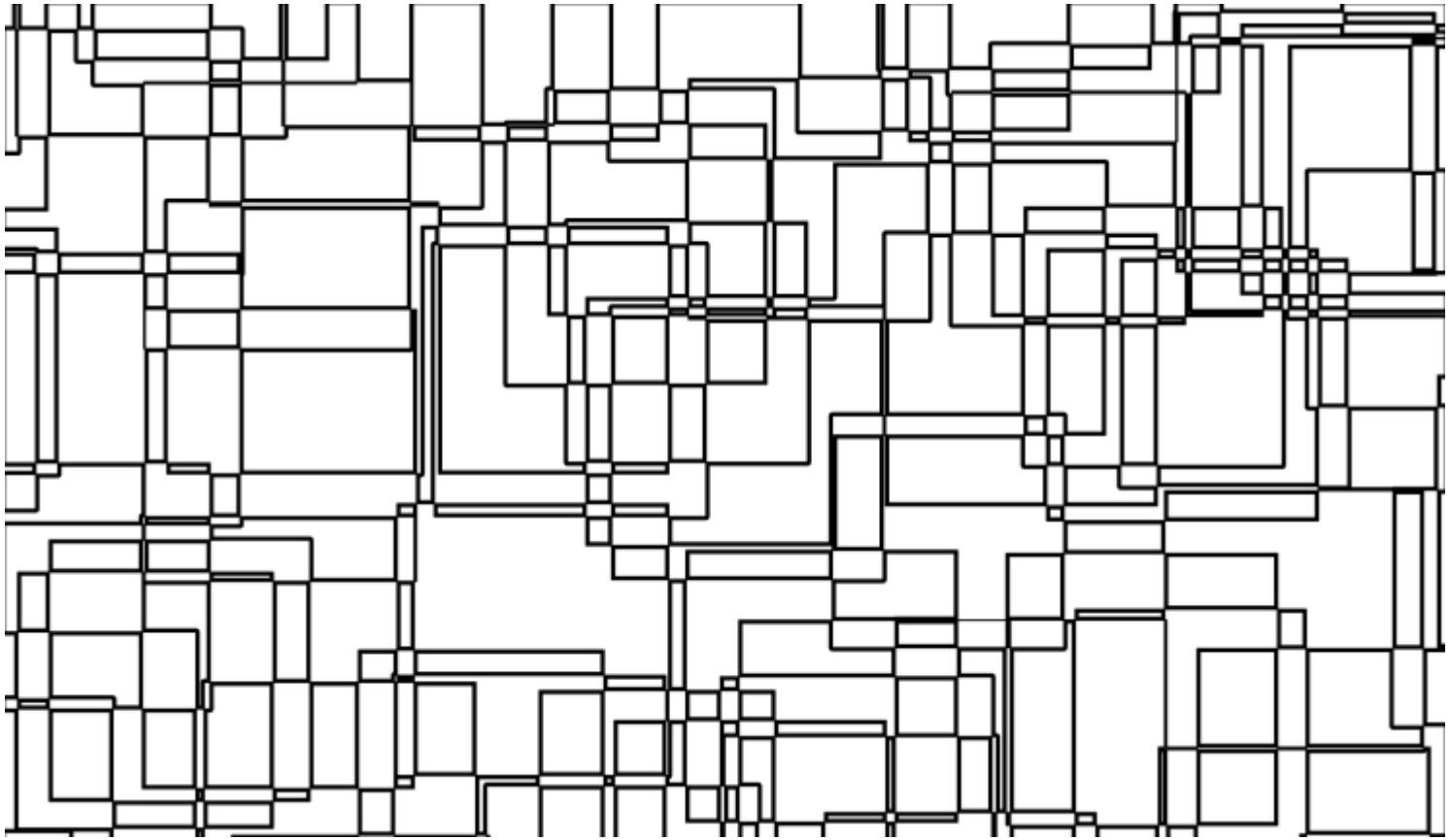


How can we navigate Complexity?



Complex systems are **open** ones; whenever we interact with them, we become part of the system, directly or indirectly influencing it





Complex problems are such that when we look at them, when we talk with them, when we engage with them, they change.

They change non-linearly and sometimes even disproportionately.

John Rendon

First, we need to understand Complex Systems

- Several (not countable) interacting components
- Components behave and communicate autonomously
- Interactions are nonlinear: minor changes can produce disproportionately major consequences
- The system is dynamic; solutions can't be imposed; they arise from the circumstances
- The system has a history, a memory; past and present are integrated
- Hindsight does not lead to foresight because external conditions and related systems constantly change



Attributes of Complex Systems

A **Attactors** i.e. the forces that stimulate the patterns of behavior

B **Boundaries** that hold the context (i.e time, space, policy, rules, roles, stc,)

I **Identities** i.e. the actors in the situation and the relationships between them

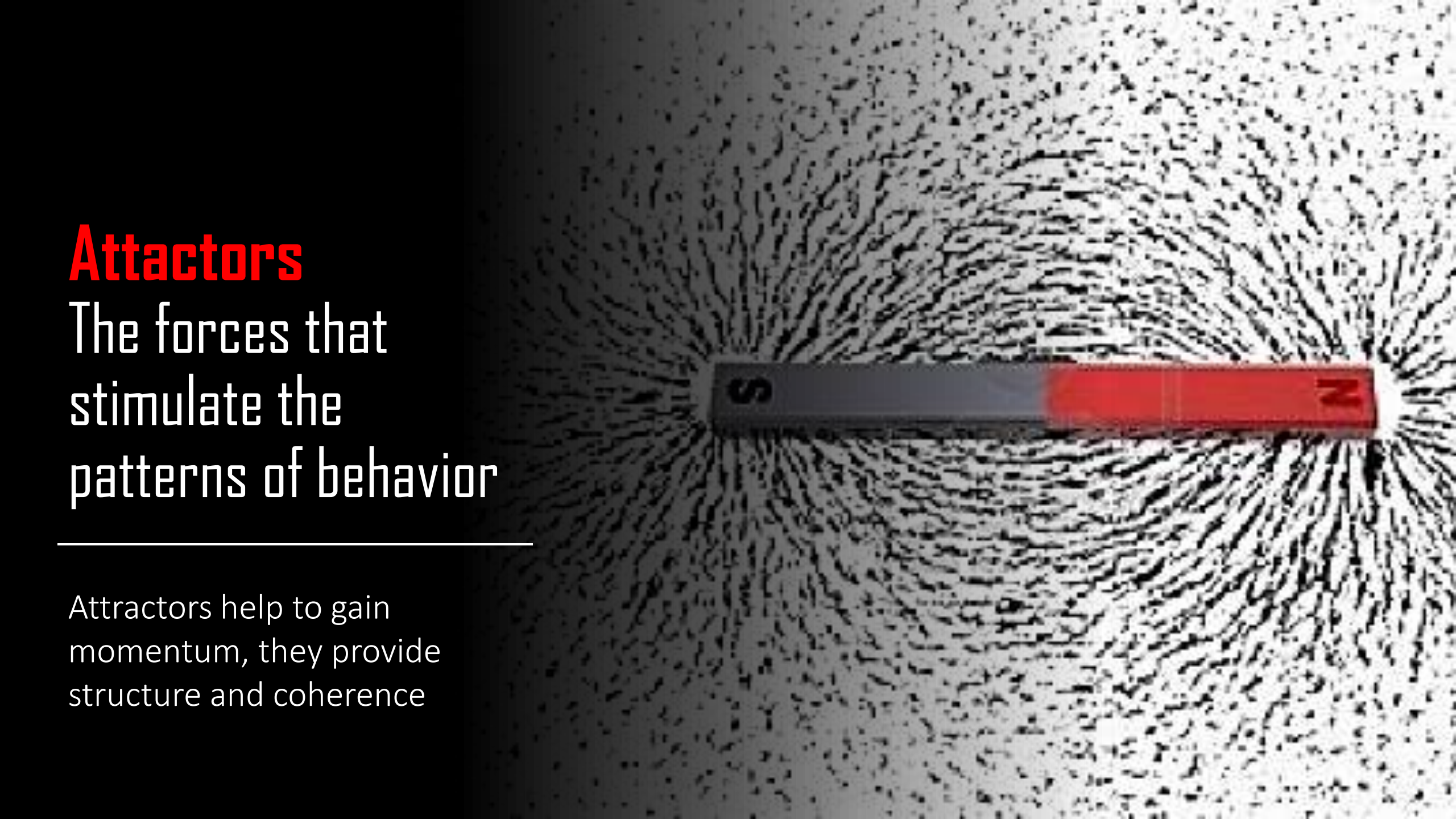
D **Dissonance** i.e. diversity and conflict that can unleash creativity and energy

E **Environmental** i.e. the context physical or virtual in which the issue is located

Attactors

The forces that stimulate the patterns of behavior

Attractors help to gain momentum, they provide structure and coherence





Telling a compelling **vision** of how to move towards organization's goals create momentum and catalyze energy (**attractor**) and define containing "bounds" where people can activate (**boundary**)

Storytelling as a "tool" to attract energies and define boundaries

On Metaphors

"Reality is mediated by the language we use to describe it, the metaphors we use shape the world, and our interactions to it"

Sonja Foss



Metaphors create alignment, synthesize accepted knowledge

Being aware of usage of metaphors in an organization helps to sense and recognize patterns, inclinations, disposition of that complex system

Complex systems change continuously
They have a history, a memory, that co-determines present behavior

While complex systems are inherently unpredictable and non-causal,
they have dispositional states that predispose them towards certain behaviors

If we understand these dispositions,
it would be less difficult to influence them

The Agile Leaders Superpowers





Developing enhanced hearing
to allow Adaptive Decision Making

Leaders have to understand the context they are in…

Too often, managers rely on usual leadership approaches
that worked well in one set of circumstances,
which fall short in other ones

Human beings wrongly assume that a certain level
of predictability always exists in the world;
this leads to simplifications and assumptions
that are only useful in ordered systems

Not in complex ones





The lens of Cynefin framework help us to sense the context we are in, accelerating and improving decision-making process

Cynefin Framework

Clear Domain

Characteristics

- Repeating Patters and consistent events
- Clear cause-and-effect relationships evident to everyone; right answer exists
- Known Knowns
- Fact-based Management

Leader's Job

- ✓ Sense, Categorize, Respond
- ✓ Ensure that proper processes are in place
- ✓ Delegate
- ✓ User best practices
- ✓ Clear and direct communication



Loan payment processing are often simple contexts

Complicated Domain

Characteristics

- Expert diagnosis required
- Cause-and-effect relationship discoverable but not immediately apparent to everyone
- More than one right answer
- Known Unknowns
- Fact-based management

Leader's Job

- ✓ Sense, analyze, respond
- ✓ Create panels of experts
- ✓ Listen to conflicting advice



Searching for oil or mineral deposits is a good example of complicated domain

Cynefin Framework

Complex Domain

Characteristics

- Flux and unpredictability
- No right answers; emergent instructive patterns
- Unknown unknowns
- Many competing ideas
- A need for creating and innovative approaches
- Pattern-based leadership

Leader's Job

- ✓ Probe, sense, respond
- ✓ Create environments and experiments that allow patterns to emerge
- ✓ Increase interactions and communication
- ✓ Facilitate ideas generation
- ✓ Open Up discussions, set boundaries, encourage dissent



The rainforest is an example of complex context

Shifting from Complicated to Complex



https://www.youtube.com/watch?v=egWvQuT5TCU

"Houston, we Have a Problem"

In the film Apollo 13 the astronauts encounter a crisis that suddenly moves the situation into a complex domain.

A group of experts is put in a room with a mishmash of materials—bits of plastic and odds and ends that mirror the resources available to the astronauts in flight.

Cynefin Framework

Chaotic Domain

Characteristics

- High turbulence
- No clear cause-and-effect relationships
- Unknowable
- Many decisions to make and no time to think
- High tension
- Pattern-based leadership

Leader's Job

- ✓ **Act, sense, respond**
- ✓ **Look for what works instead of seeking right answers**
- ✓ **Take immediate action to re-establish order**
- ✓ **Provide clear, direct communication**



September 11th 2001 Attacks

The events of September 11 were not immediately comprehensible; the crisis demanded decisive action.

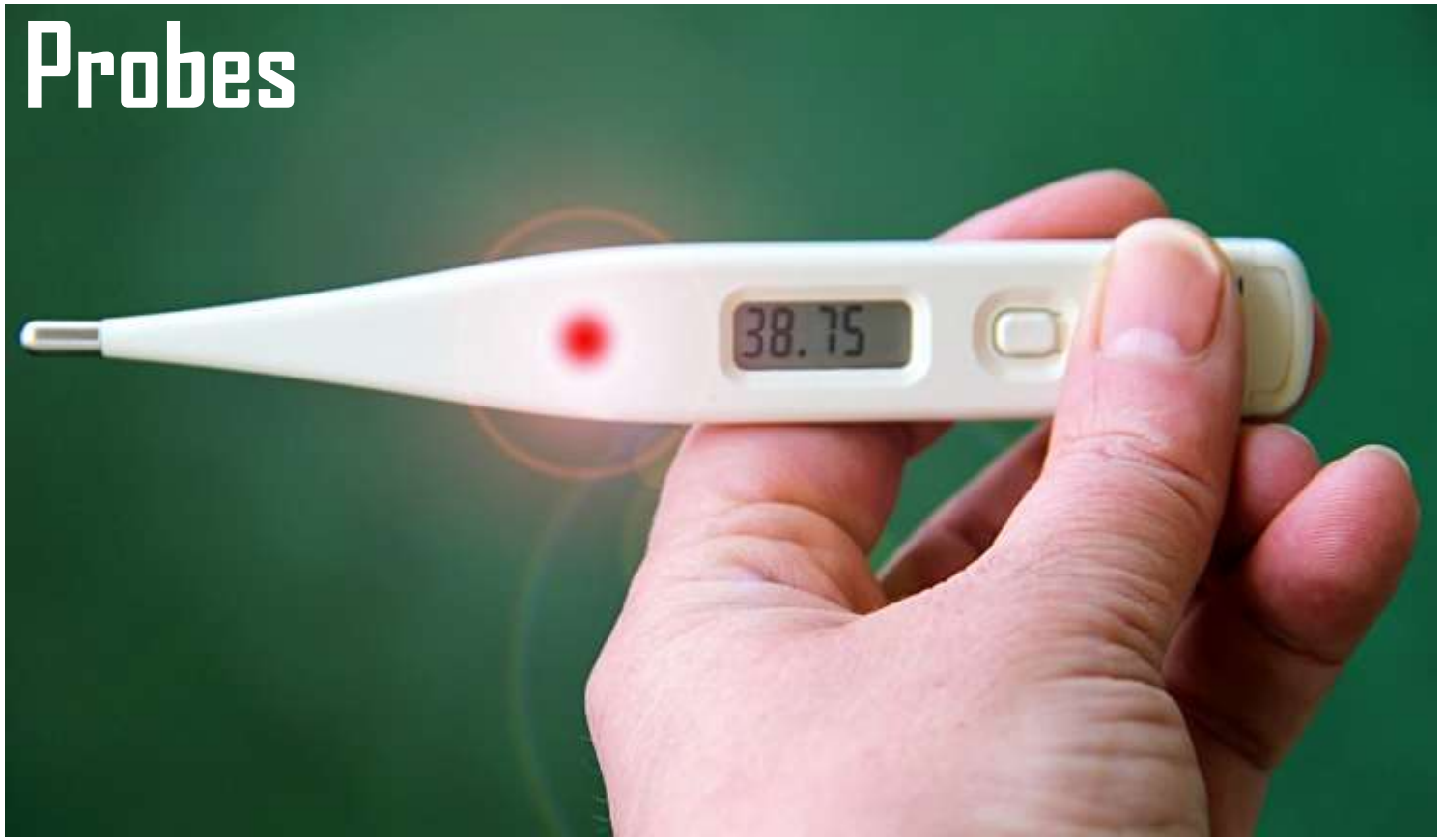
New York's mayor at the time, Rudy Giuliani, demonstrated exceptional effectiveness under chaotic conditions by issuing directives and taking action to reestablish order.

However, in his role as mayor—certainly one of the most complex jobs in the world—he was widely criticized for maintaining the same top-down leadership style, that proved so enormously effective during the catastrophe, even after it was ended.



Acquire x-ray view
thanks to iterative experimenting

Probes



“Put" probes into the system to measure and learn how the it reacts

Probles help to understand how systems are oriented and disposed to "move" in a certain direction,

Probes are **small experiments** and, moreover, **safe ones**

Safe means that if we fail - and in complexity the percentage of failure is very high - we can afford it, without compromising the whole development activity

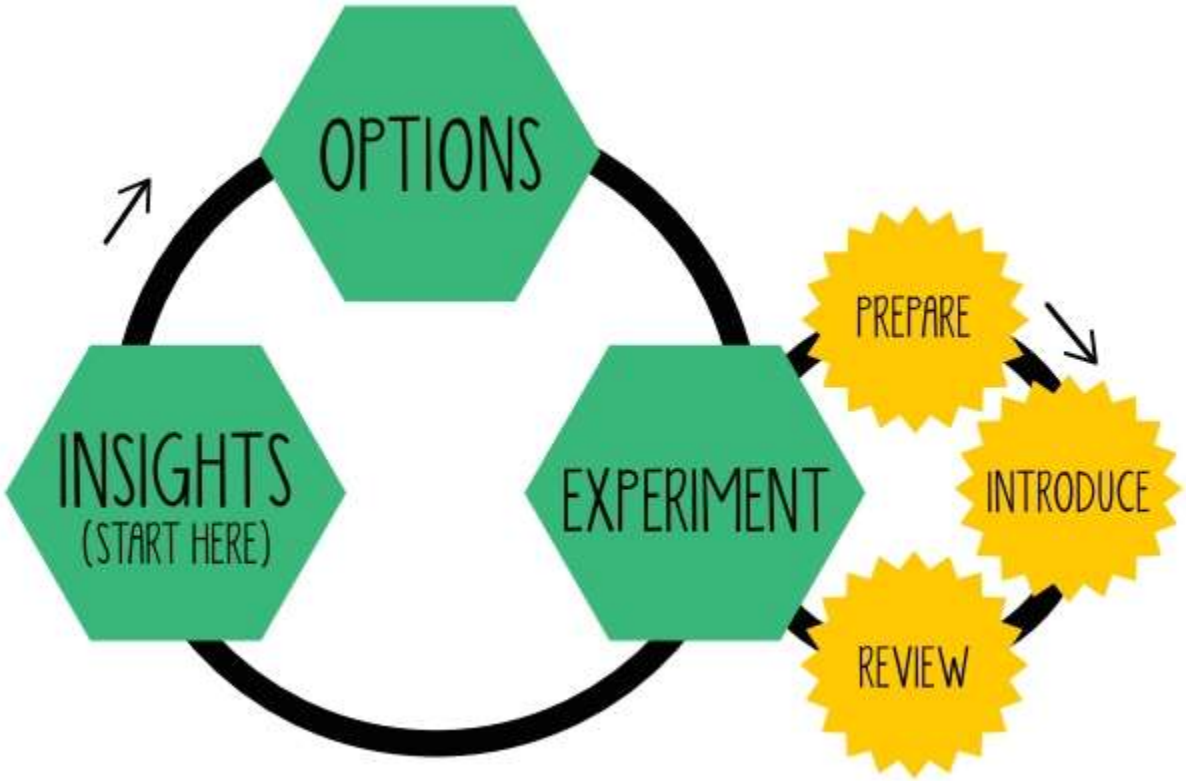


SAFE-TO-FAIL EXPERIMENTS

"Safe to fail experiments are small scale experiments that approach an issue from a variety of angles in small and safe to fail ways to allow emerging possibilities to become observable"

Trent Hone

A reliable framework for driving experimentation...

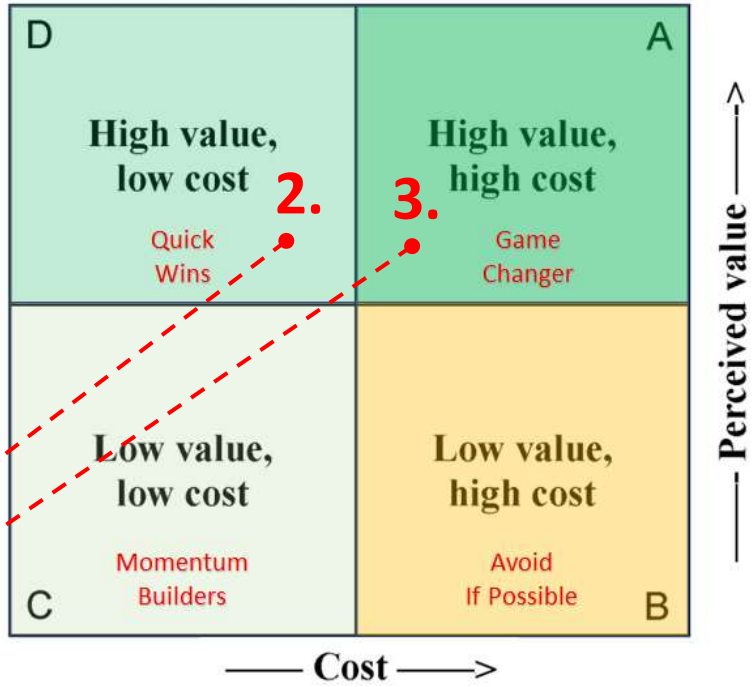


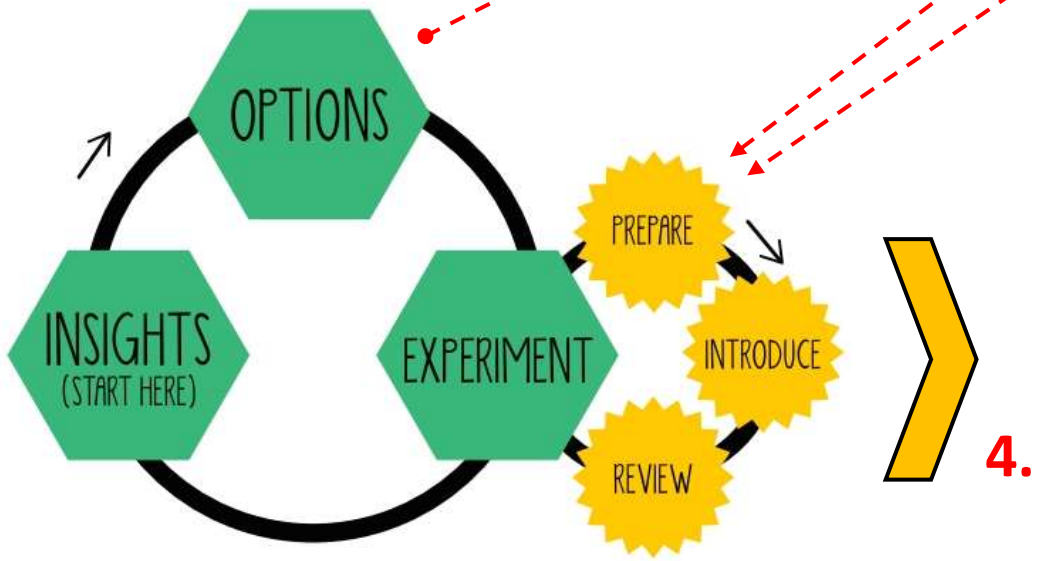
Lean Change Management (LCM) is the Lean-Agile way of introducing change in organizations

It is rooted on Lean Startup approach and diversify itself from standard change management approaches by totally embracing agile and lean values and principles

...down to execution

Candidate experiments (Options) shall be assessed against a Cost/Value matrix





- ✓ **Prepare**: First, It is necessary to clarify what piece of learning is needed and plan the experiment accordingly
- ✓ **Introduce**: the experiment (probe) is introduced and executed in the reference context
- ✓ **Review**: results are inspected, insights are extracted and will feed the next outer cycle



Improving tactile sense thanks to Continuous Learning

The author tells the story of a lily plant and its characteristic of doubling the number of leaves each day.

If, during summer, you passed by the side of a lake that hosts it, you would not notice that the single leaf of the previous day is today in company of its twin; just as it would be difficult to notice the incremental duplications during the upcoming days.

You would certainly start noticing the phenomena, with surprise, when the surface of the lake to be occupied is a quarter of its total size, and that happened in just one night.

For many events in the business, that a-Ah moment would be too late already; in just three days the surface of the lake would be completely invaded by the plant.



Capturing Weak Signals



Organizations need to further develop their external and internal sensors, to collect and spread timely, continuous and punctual information

---

*Today, more than in any other moments we lived, being able to perceive, understand and interpret the **weak market signals**, makes a substantial difference for thriving (and in some case surviving)*


When was the last time your team talked to actual end-user?

Collective intelligence process to interpret weak signals and early warnings



Weak Signal:

- ✓ Fragmented
- ✓ Uncertain reliability
- ✓ Unpredictable
- ✓ Apparently no utility
- ✓ Unusual, singular
- ✓ Submerged

Organizations need to create habits for systematically collect insights from the field. People need to meet, share and discuss to discover any emerging patterns, from their first appearance

- COPs
- Lean Coffee
- World Café
- Open Space
- Reviews
- Retrospectives



Open-Adaptive Strategy to develop hyper flexible muscles

Strategy, traditionally, was always formulated at the top, communicated to the whole company, then executed by employees

Top-down. Simple, linear, straightforward. Clear boundaries between the ones who design and those who execute. Isn't it?

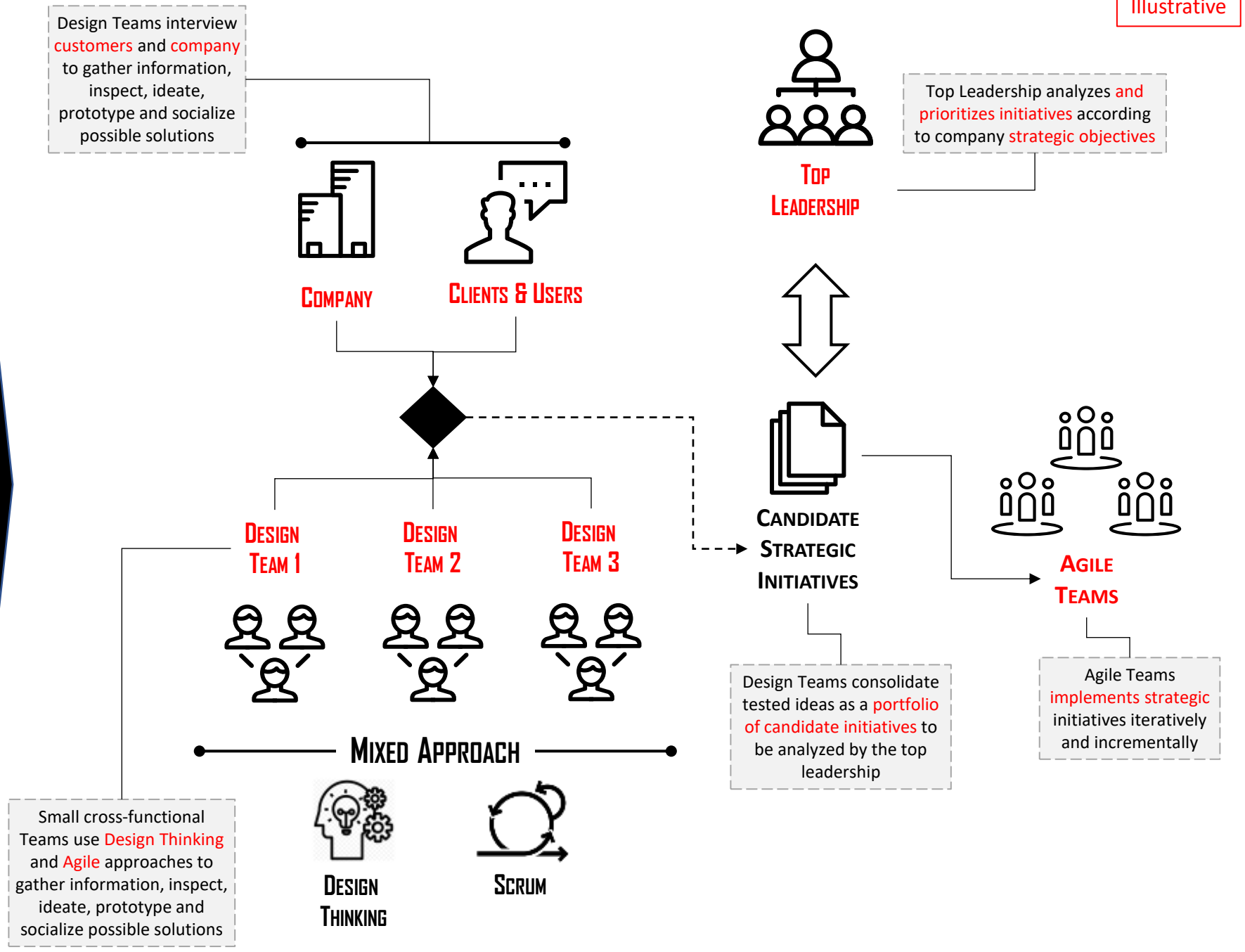
Today, traditional way of defining and executing strategy, does not work anymore



Open Strategy

Open Strategy means to involve employees who know the customer, the business and the belonging organization, in strategy formulation

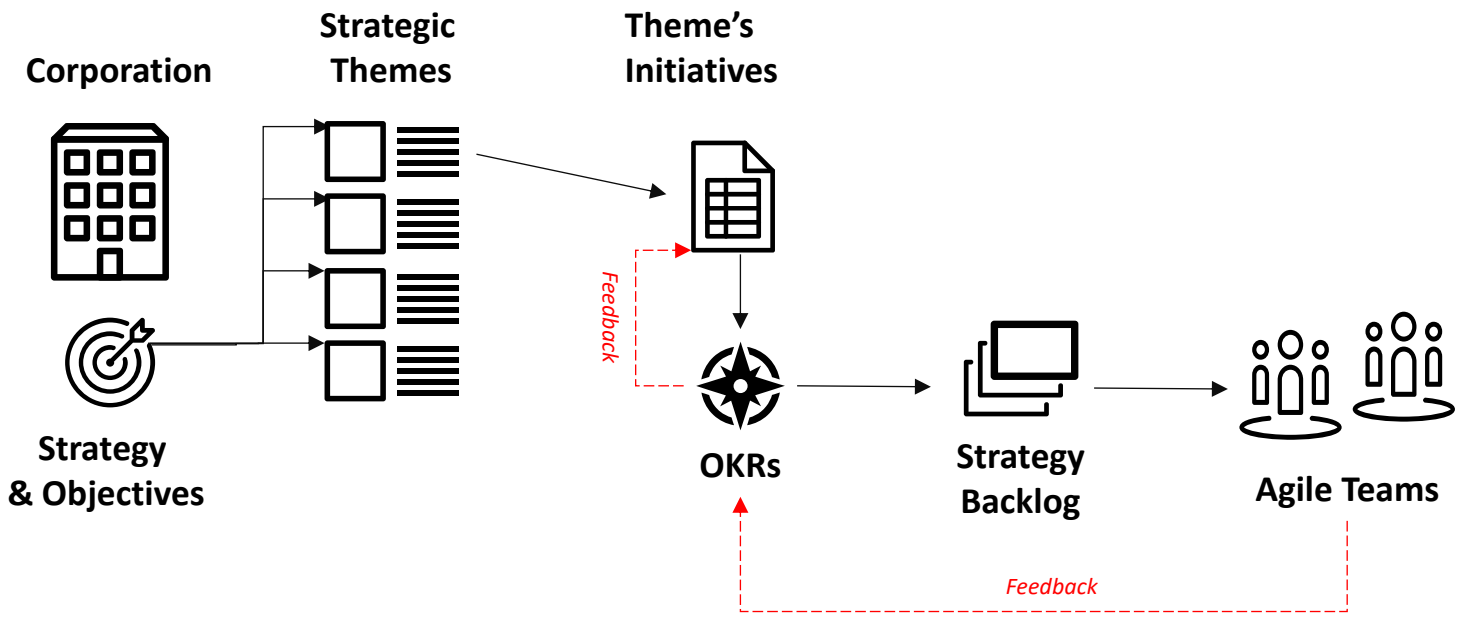
Illustrative



Adaptive Strategy

Adaptive Strategy is an approach characterized by adaptive planning, iterative and incremental adoption and development
It is strongly based on continuous improvement and rapid and flexible response to change

Agile companies depict high level strategy by decomposing it in strategic themes, connected initiatives, expressed through OKRs which drive execution, measurement of results and feedback

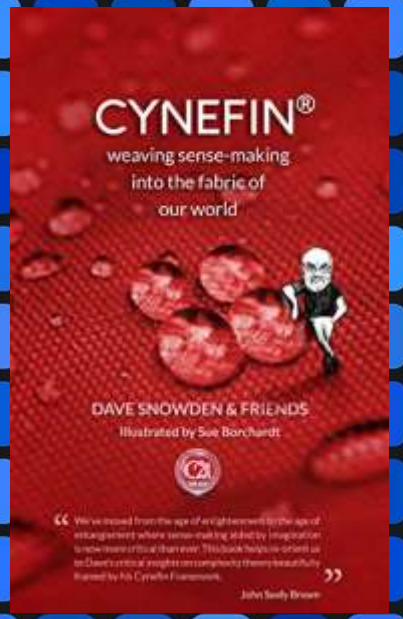


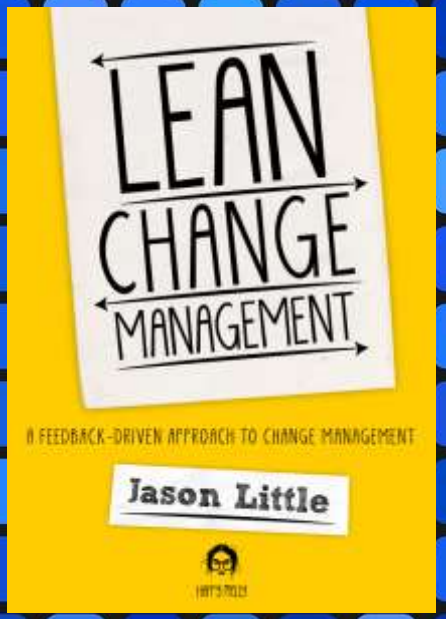


Seeing through Complexity

- ✓ Sense the context
- ✓ Frame the challenge
- ✓ Establish the minimal enabling constraints
- ✓ Encourage parallel experimentation
- ✓ Set short and nested feedback loop
- ✓ Inspect the results
- ✓ Search for any possible patterns
- ✓ Exploit the best-fitting solution that emerges

Thank You!





Emiliano Soldi

@AgileTriathlete

https://www.EmilianoSoldi.it