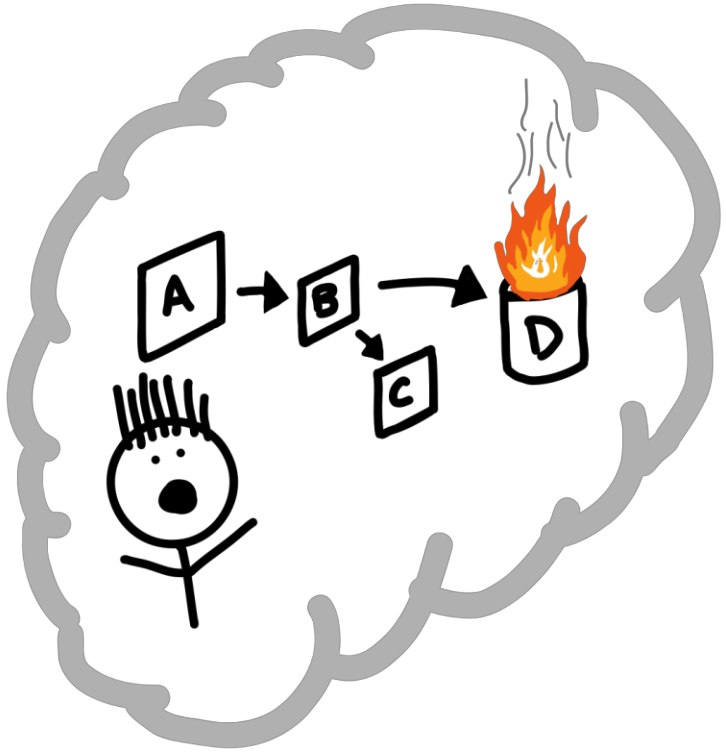
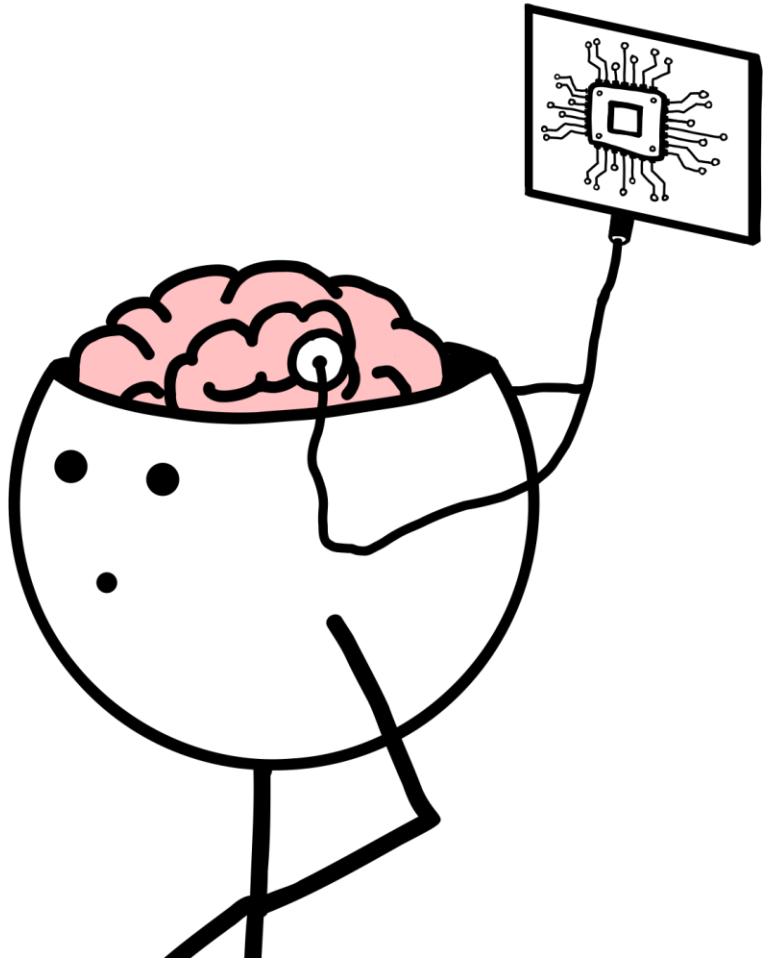
Mind Hacks

for Incident Analysis





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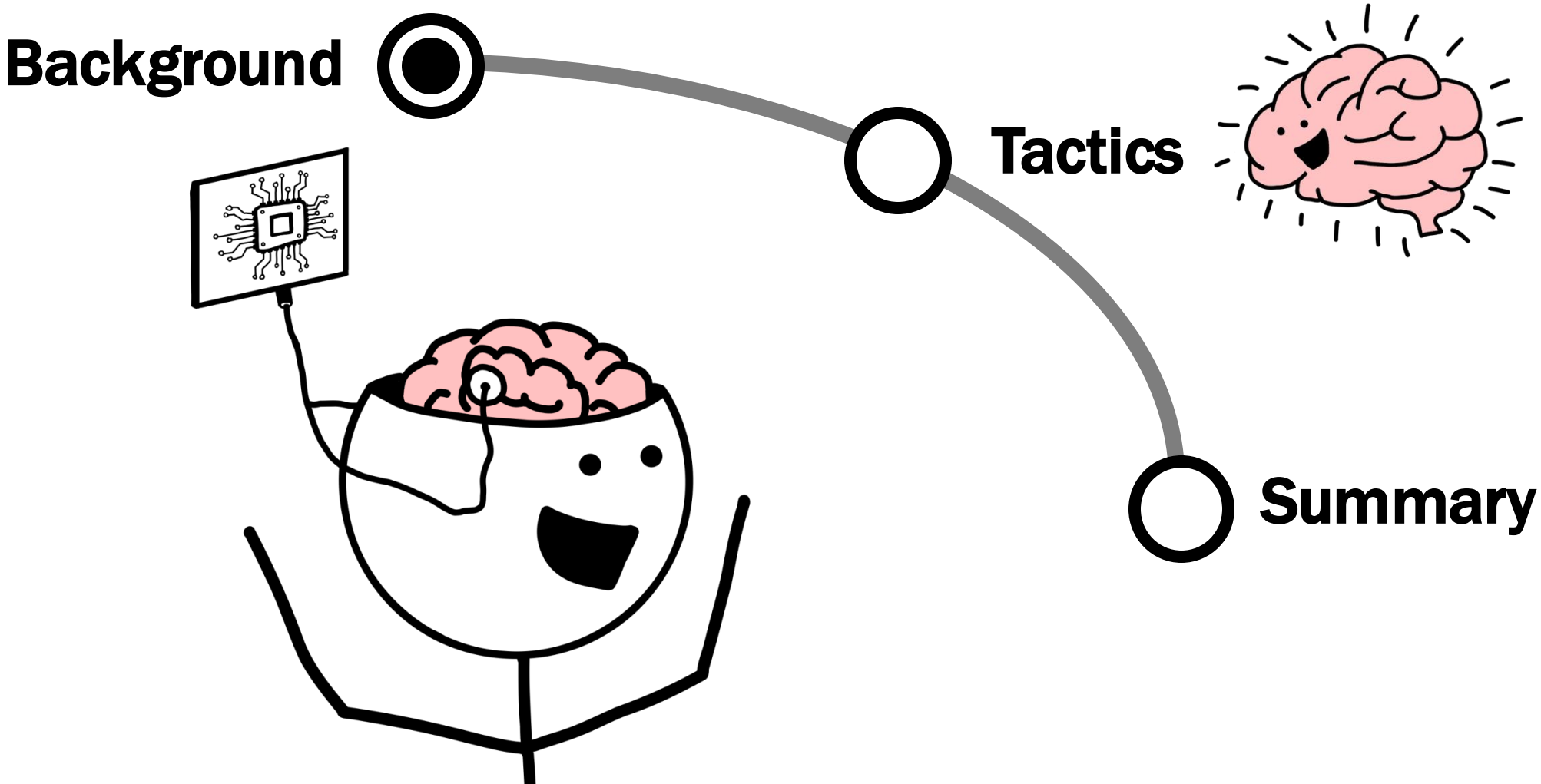
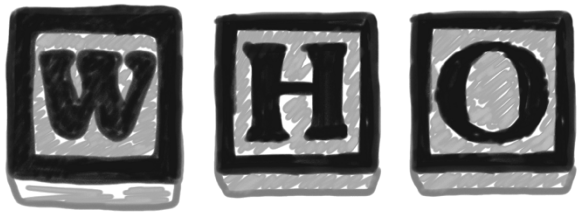
Journey



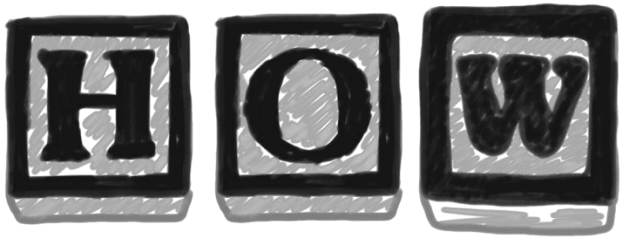
Failure is normal



Old View

Failure is caused in complex systems by the acts of fallible people.

Failure is an unpleasant surprise.

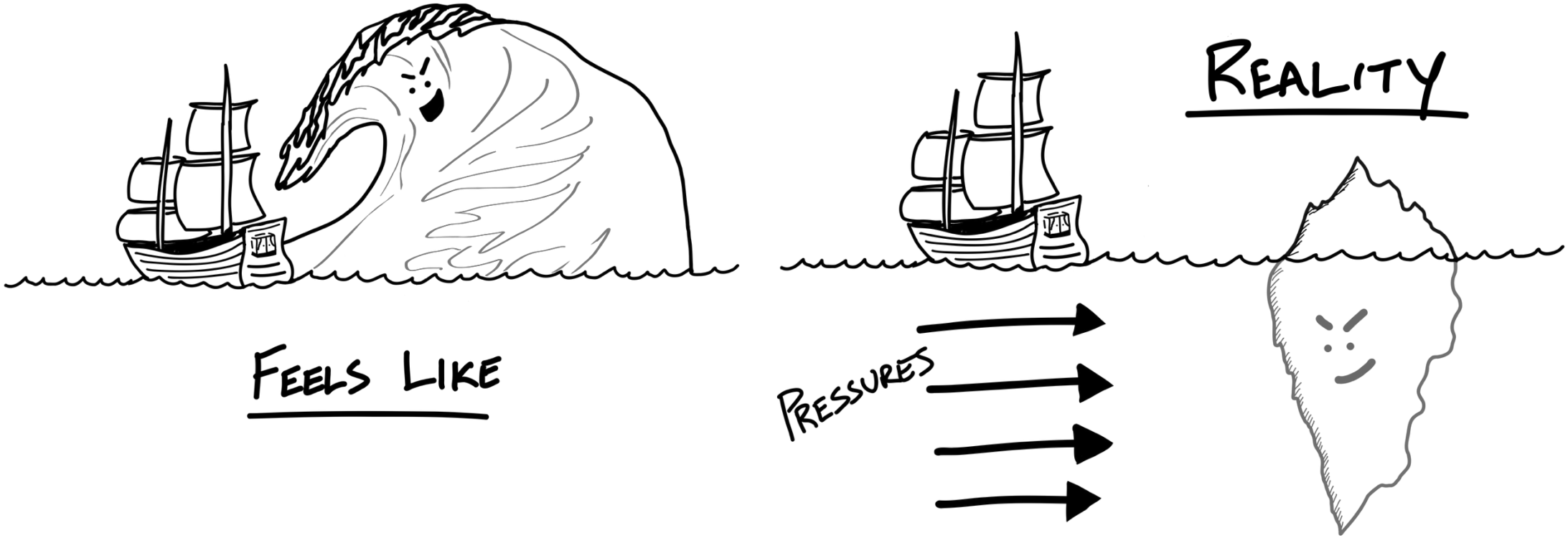


New View

Looks at accidents as being normal. Seeks to understand how people made their decisions.

“Human error” is the starting point of investigation.

Failure is a Systematic Drift



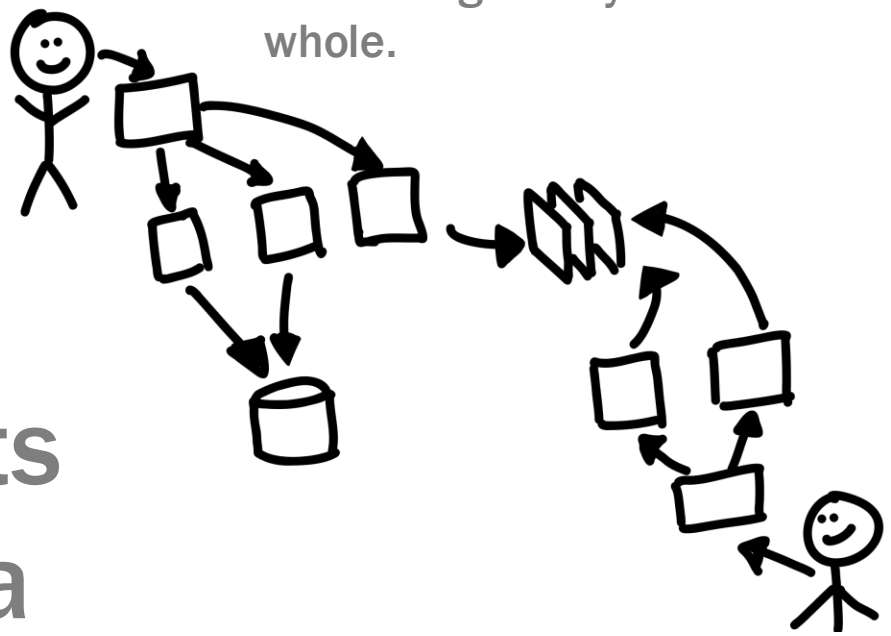
Organizations tend to drift into failure as people adapt to pressures and make small, local decisions that seem harmless.

Reference: Drift into Failure

Appreciating Systems

Dr. Deming's System of Profound Knowledge

Includes people, processes, organizations, tools, technology - all interacting in ways that affect the whole.



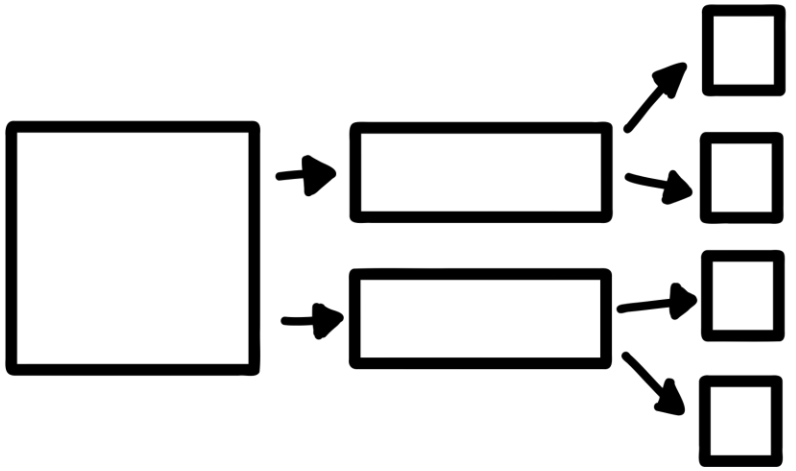
System is a network of interdependent components that work together toward a common aim.

Reference: The New Economics for Industry, Government, Education

Linear Thinking

Reductionistic thinking, breaking something down into parts.

How we often approach technical problems, which is effective, but limited when it comes to complex systems.

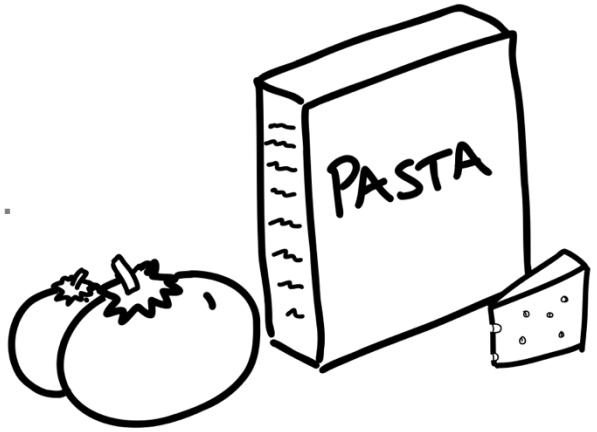


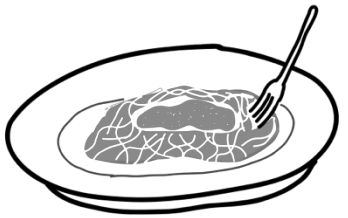
Systems Thinking

Understanding and designing software by focusing on how different components **interact** and **affect the system as a whole.**

Linear Thinking

Following a recipe, add ingredient A, then B, then C. Assumes outcome from isolated steps.

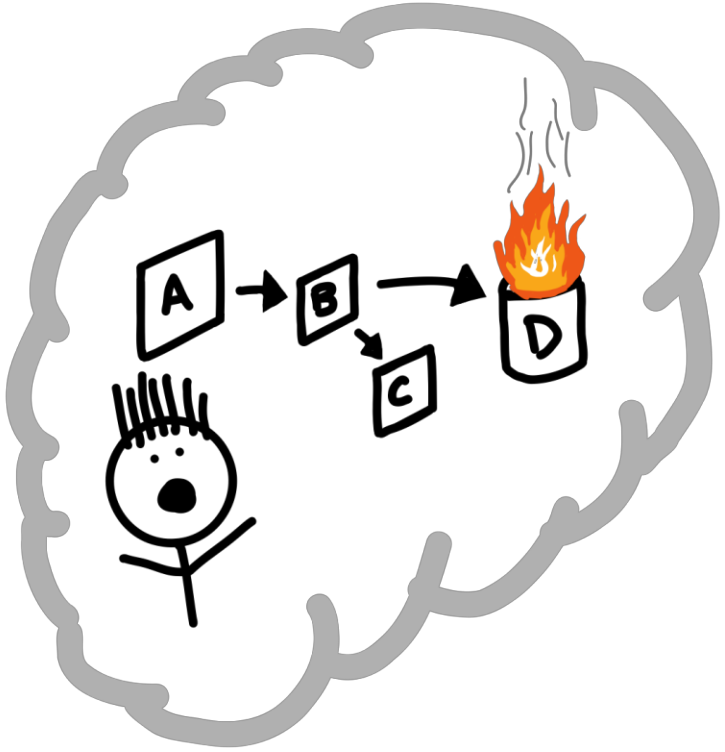


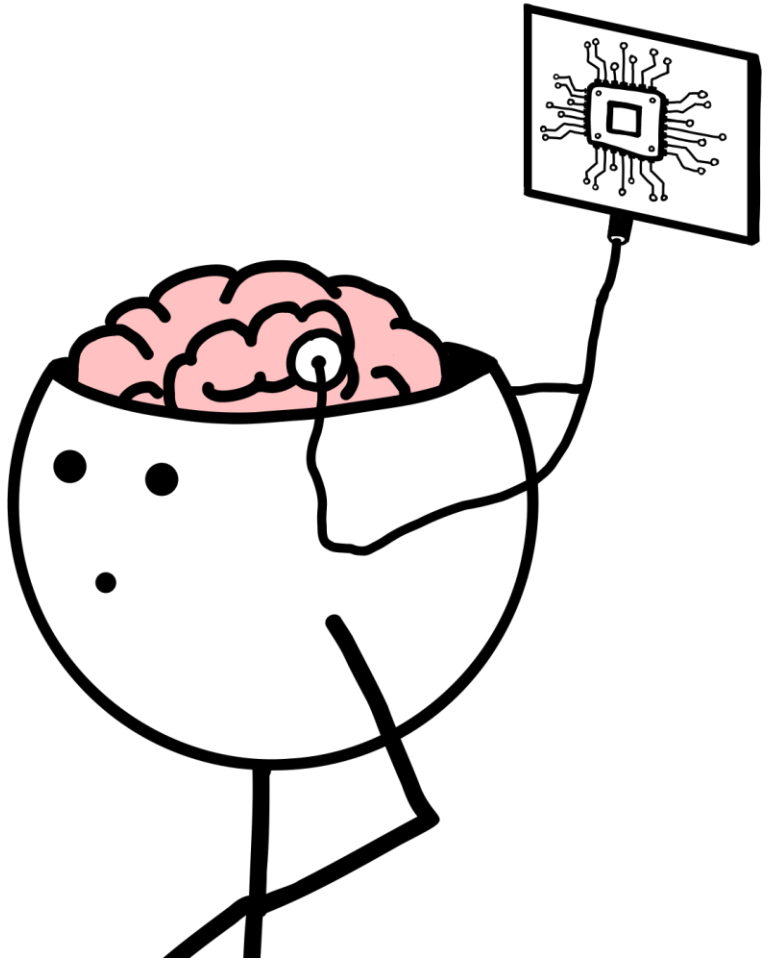


Systems Thinking

Making a meal, thinking through how the ingredients react, flavors blend in the sauce, and changing one thing affects the entire outcome.

Tactics





Recognizing Biases

Outcome Bias

"Once you know the outcome, it changes your evaluation of decisions that led up to it. If the outcome is bad, then you are not only more willing to judge the decisions, but also more likely to judge them more harshly."

Don't start with the outcome and work backwards to how they made their decision. You need to start with what they knew at the time of making their well-intended decision.

Reference: The Field Guide to Understanding 'Human Error'

Recognizing Biases

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Hindsight Bias

"Finding out about an outcome increases the estimate we make about its likelihood. In other words, as a retrospective reviewer who knows the outcome of an event, you exaggerate your own ability to predict and prevent the outcome - while not even being aware of that bias."

Avoid using the words "why" and "who," as those are strong signals that you are judging those in the event. Practice using "what" and "how" to learn more about the event without indicating an individual is to blame in the overall system.

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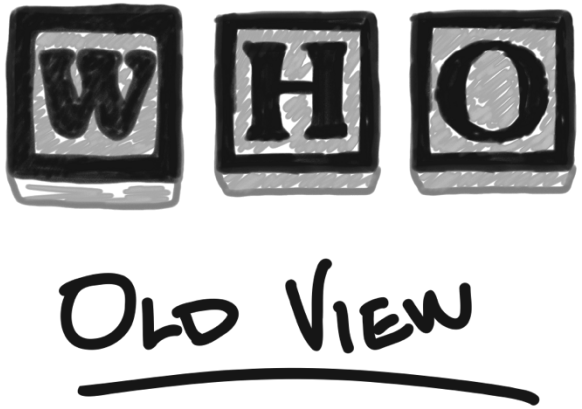
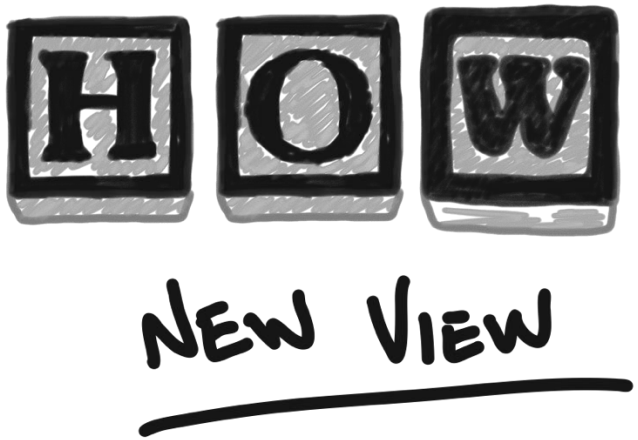
Infinite “Hows”

Rather than using 5-whys, apply questioning within an unbounded depth of using “How”





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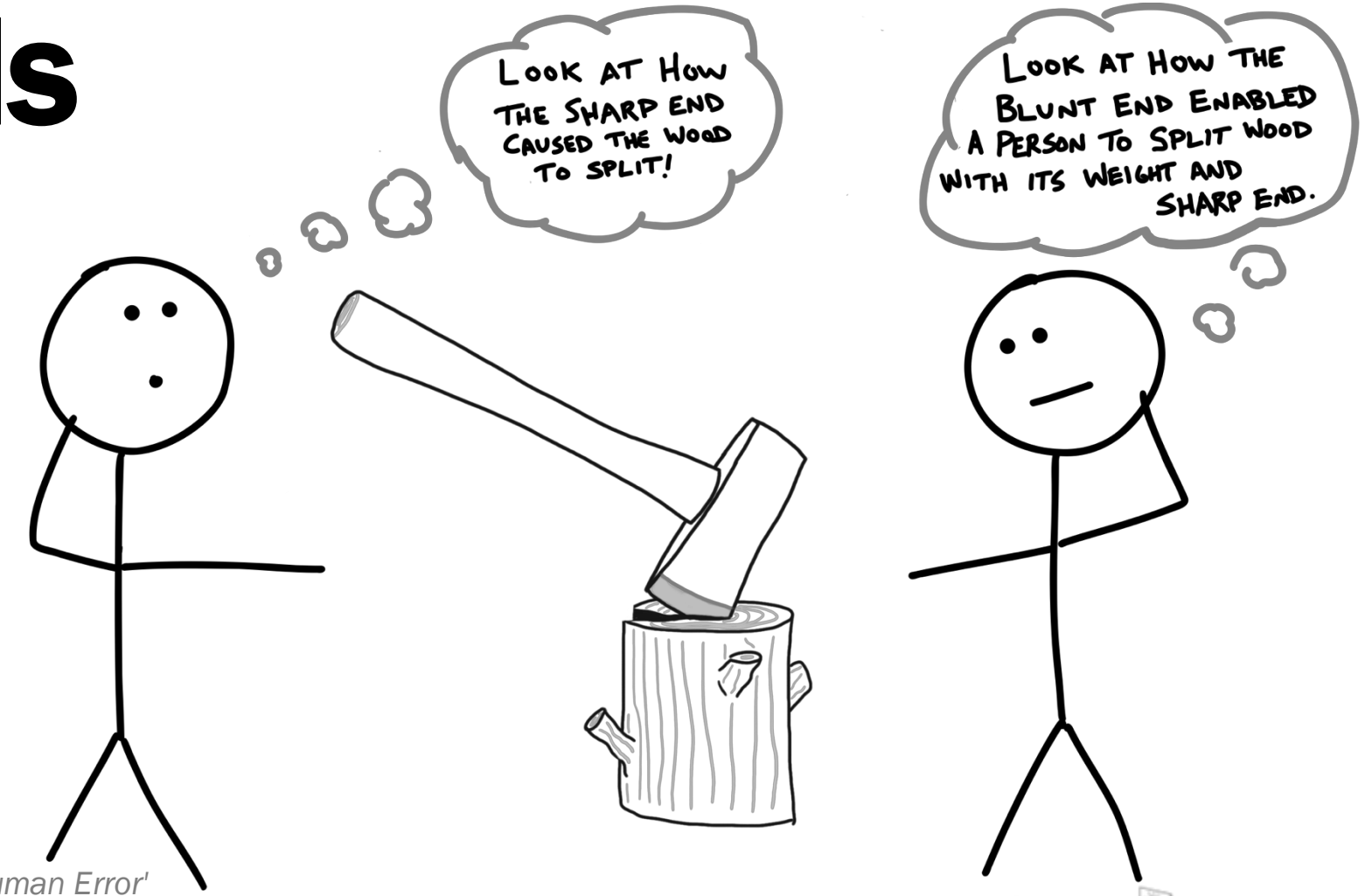
Seeing both the Blunt and Sharp Ends

The blunt end influences the behavior of the sharp end, though it isn't typically the area of focus.



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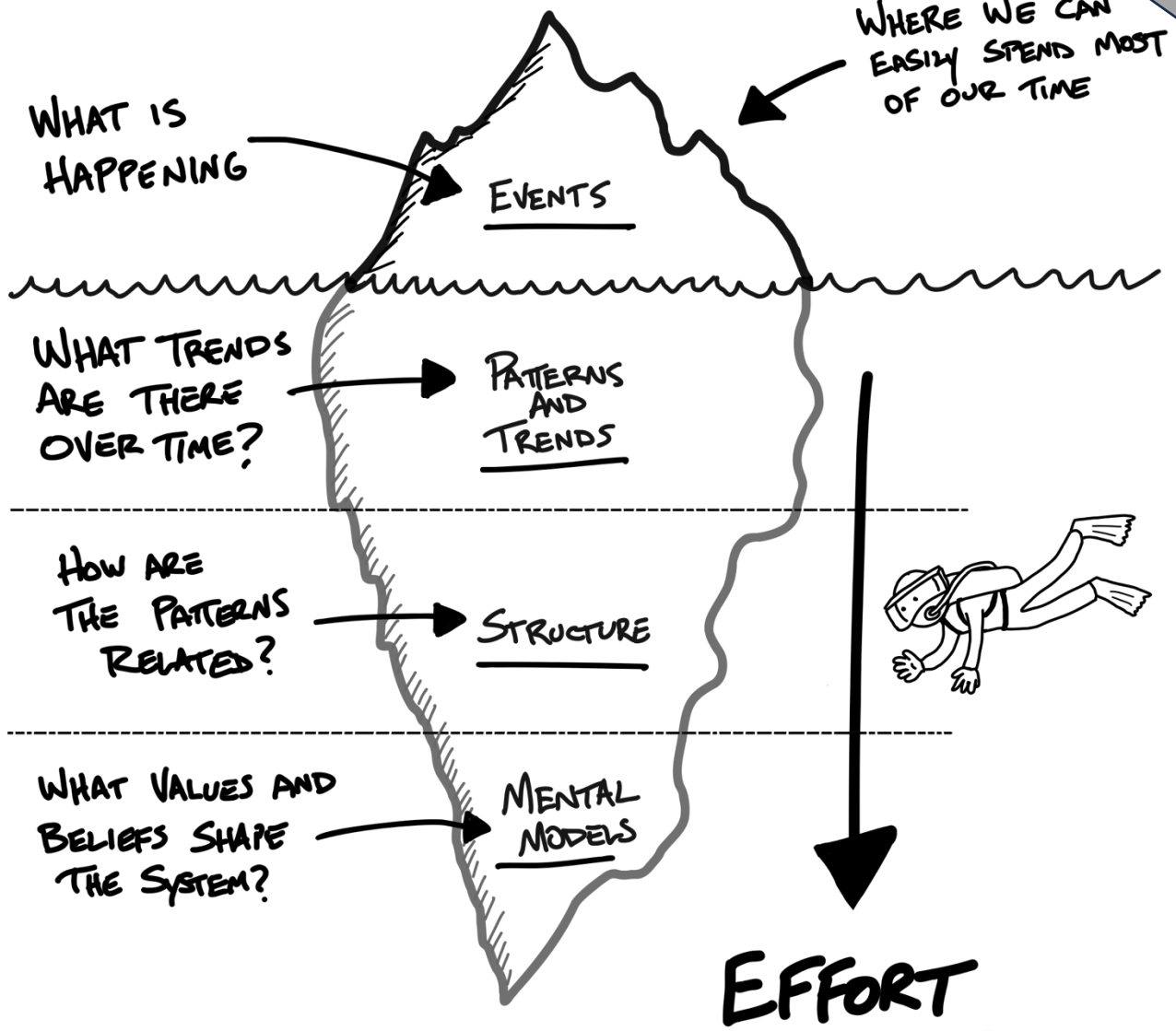
Explore the Iceberg

The Iceberg Model can guide our thinking to find lasting and meaningful change.



Reference: Learning Systems Thinking

Problem Framing

Find ways to reframe the problem to expose an ideal option.

Bring outsiders into the discussion (boundary spanners)

Get people's definitions in writing (avoid confusion)

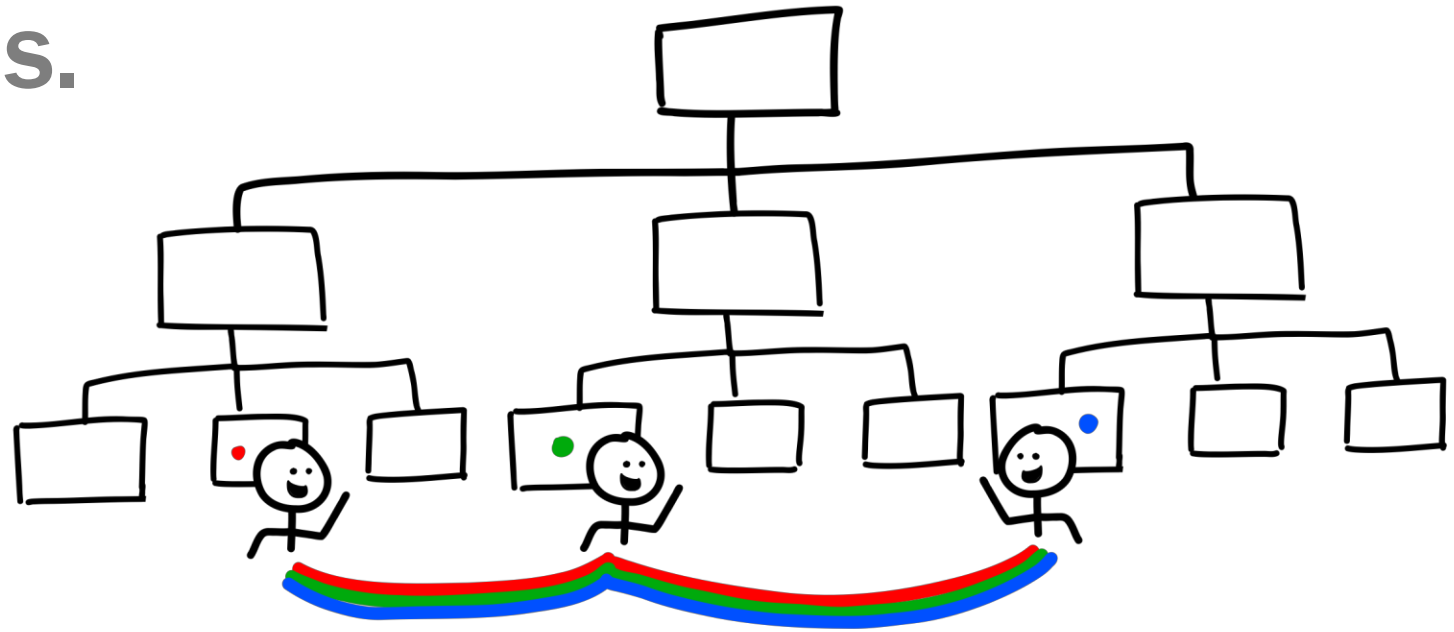
Ask what's missing (what has not been captured?)

AI can help.

Diverse Perspectives

In your incident analysis, include different perspectives to learn more about the system, and ask questions.

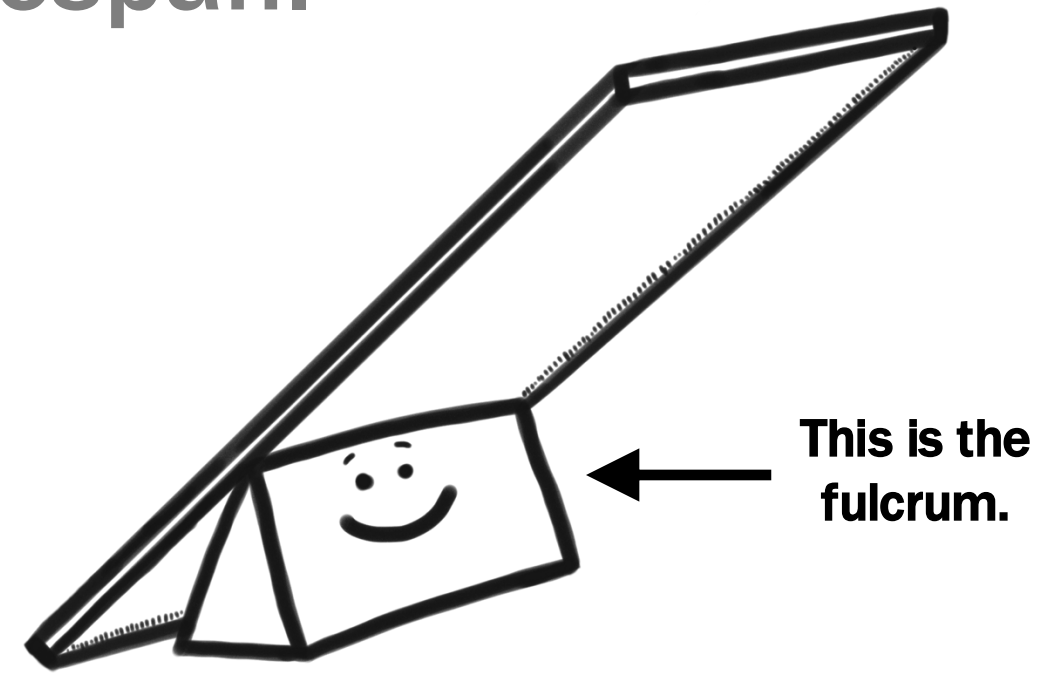
Leverage perspectives from different areas of your organization (not the same local team).



Fulcrum Hunting

Seek leverage points which produce larger benefits throughout its lifespan.

Leverage points are not intuitive.

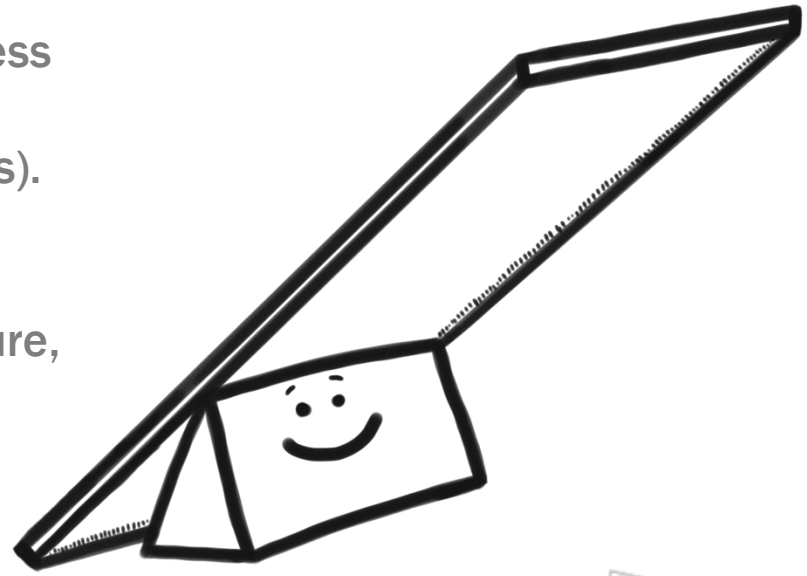


Twelve Leverage Points

by Donella Meadows

EFFECTIVENESS

12. Constants, parameters, numbers (such as subsidies, taxes, standards).
11. The sizes of buffers and other stabilizing stocks, relative to their flows.
10. The structure of material stocks and flows (such as transport networks, population age structures).
9. The lengths of delays, relative to the rate of system change.
8. The strength of negative feedback loops, relative to the impacts they are trying to correct against.
7. The gain around driving positive feedback loops.
6. The structure of information flows (who does and does not have access to information).
5. The rules of the system (such as incentives, punishments, constraints).
4. The power to add, change, evolve, or self-organize system structure.
3. The goals of the system.
2. The mindset or paradigm out of which the system — its goals, structure, rules, delays, parameters — arises.
1. The power to transcend paradigms.



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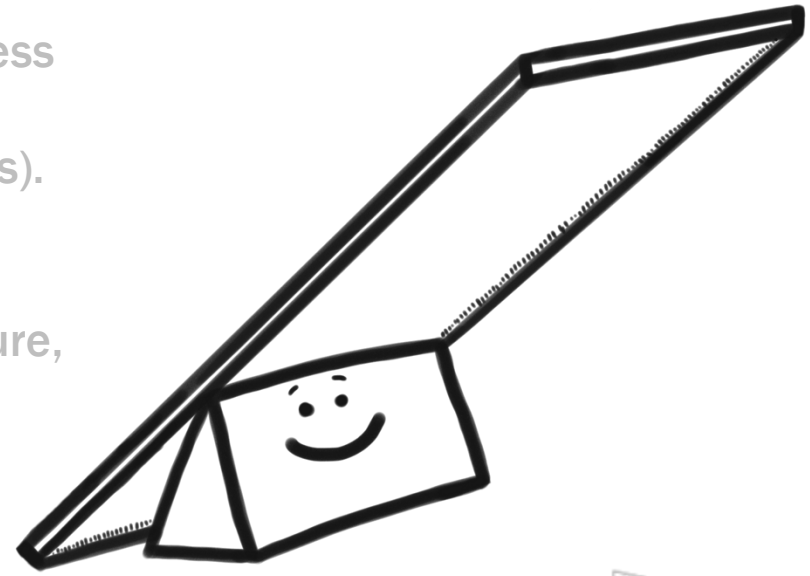


Example Leverage Points

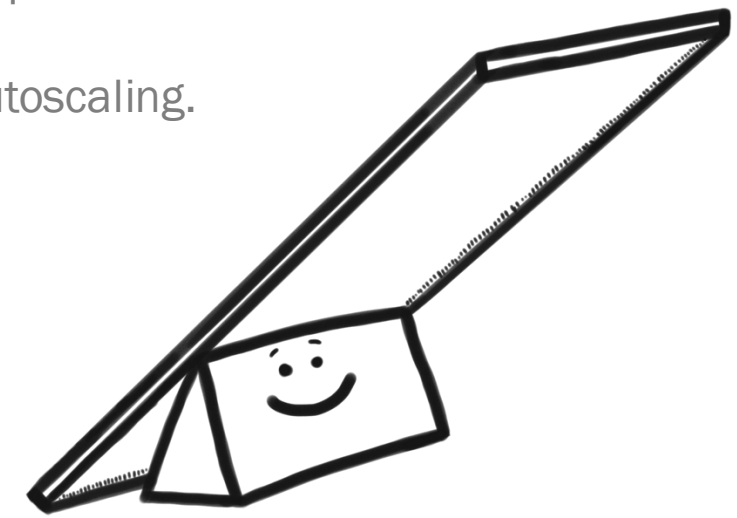
12. Constants, parameters, numbers (such as subsidies, taxes, standards).

Memory Limits in a Service

Setting higher or lower memory limits to allow more or fewer concurrent requests.

Thresholds for Alerts

Modifying CPU or response time thresholds that trigger system alerts or autoscaling.



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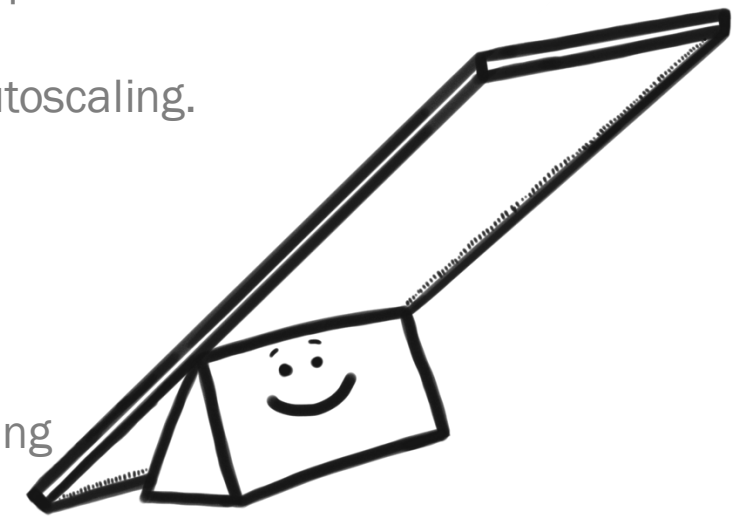

Circuit Breaker Pattern
Feedback Loop: Protects systems from cascading failures by quickly stopping requests to failing service dependency.
Intervention Example: Decreasing the threshold for tripping the breaker.
Impact: Stronger loop means faster isolation of failing service dependency, increasing overall stability.

Example Leverage Points

Due to lower required effort, we often spend more time here... (less impact)

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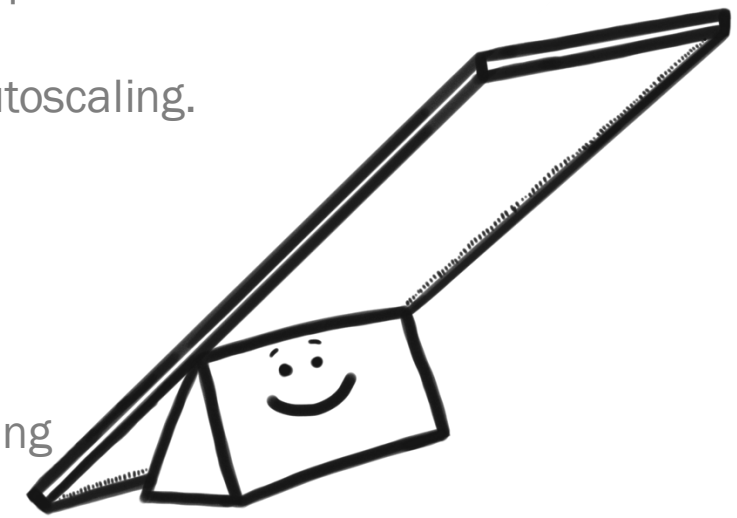

Circuit Breaker Patter
Feedback Loop: Protects systems from cascading failures by quickly stopping requests to failing service dependency.
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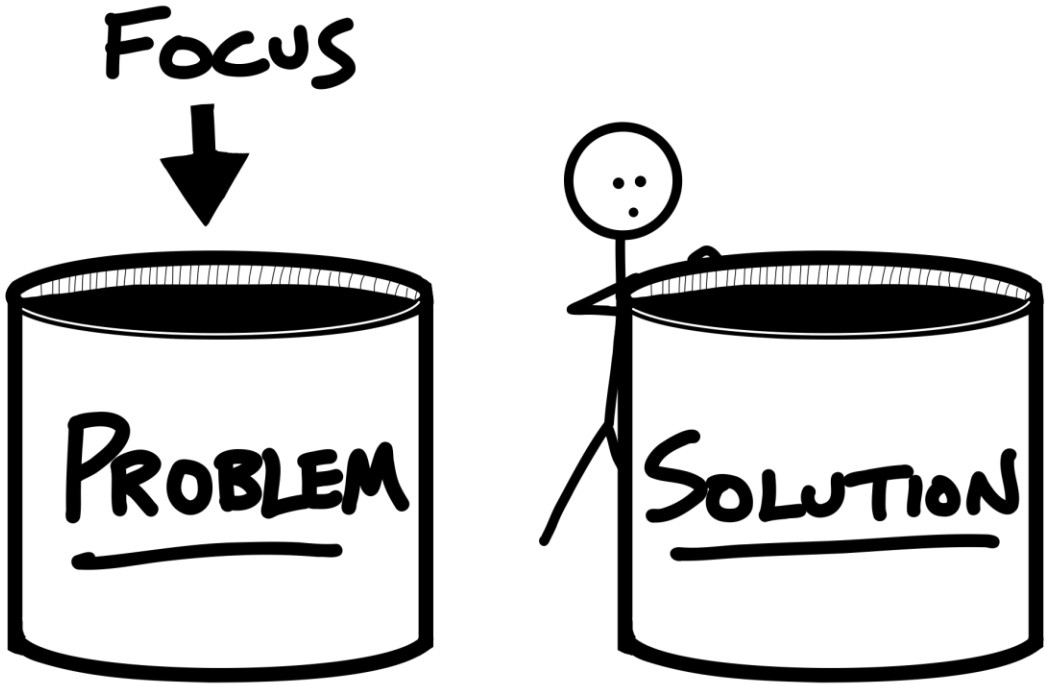
Navigating Spaces

During incident analysis, it is easy to jump into the solution space.



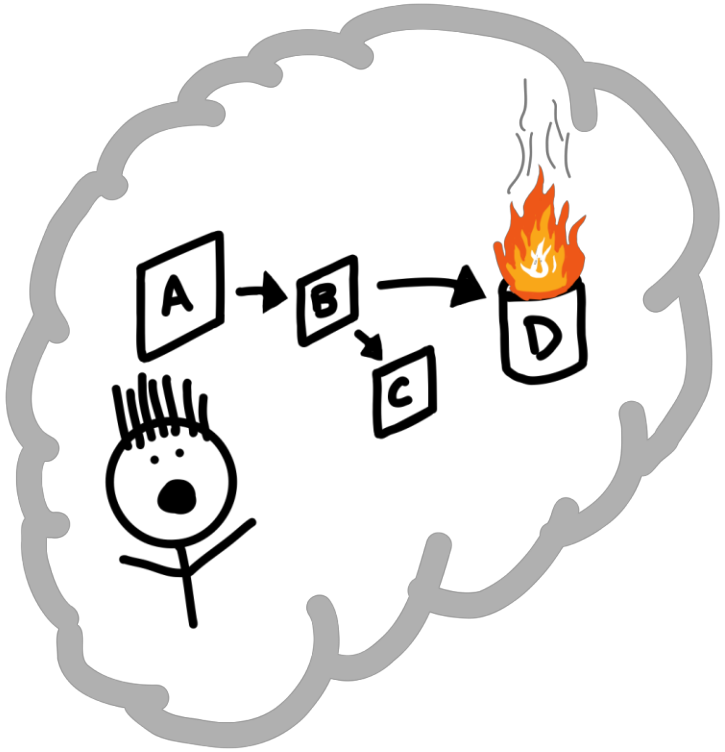
Capture ideas as they emerge but keep your focus on learning what occurred.

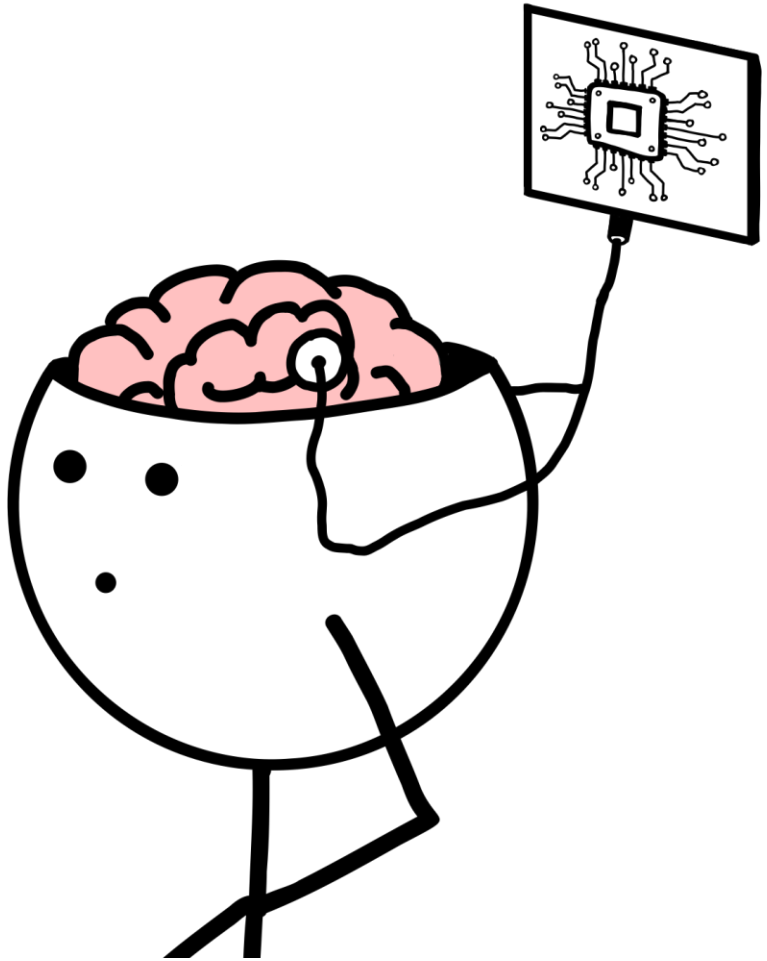
The Large Dog Method

Seek deep creative thinking periods in your life.

With changes in life, look at those as opportunities to find new creative thinking periods.

Summary





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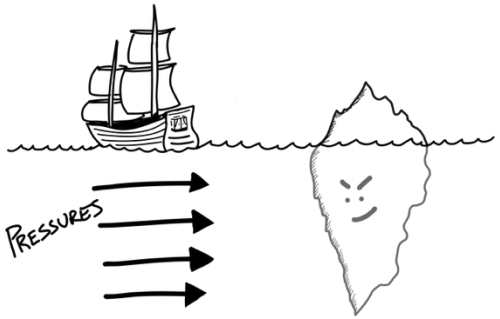
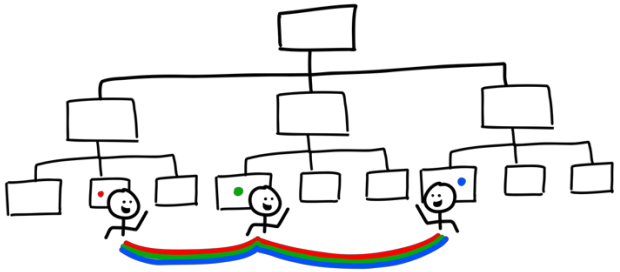
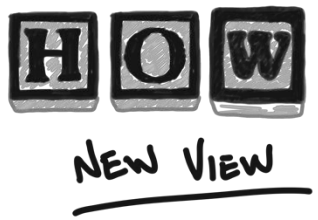


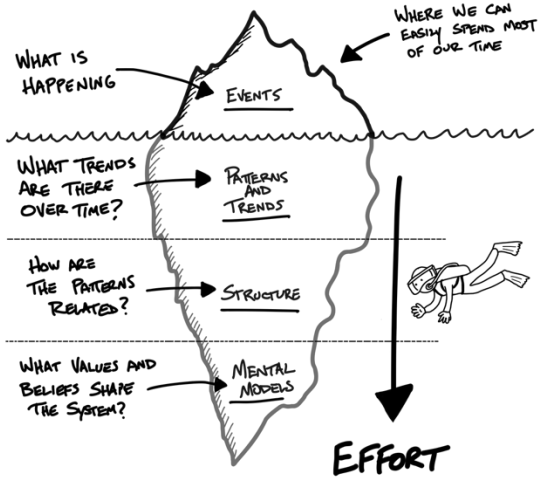
Recognize the gradual drift into failure.



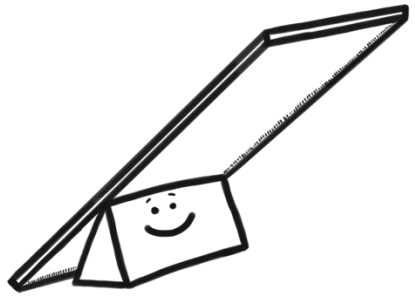
Intentionally include different perspectives in your incident analysis.



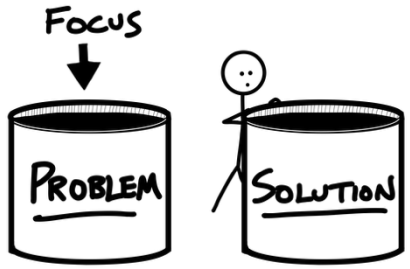
Intentionally use “How” over “Why” to learn about the system.



Leverage the Iceberg Model to discover the second story of a system failure.

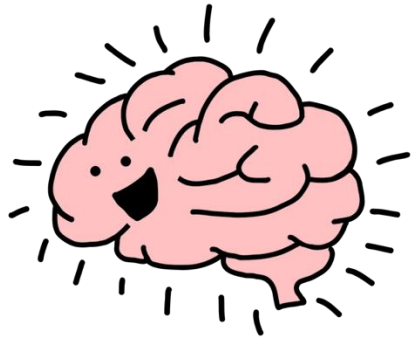


See the system that has a spectrum of leverage points that can influence its behavior.



Keep focus on the problem space, knowing it is easy to jump into the solution space.

References



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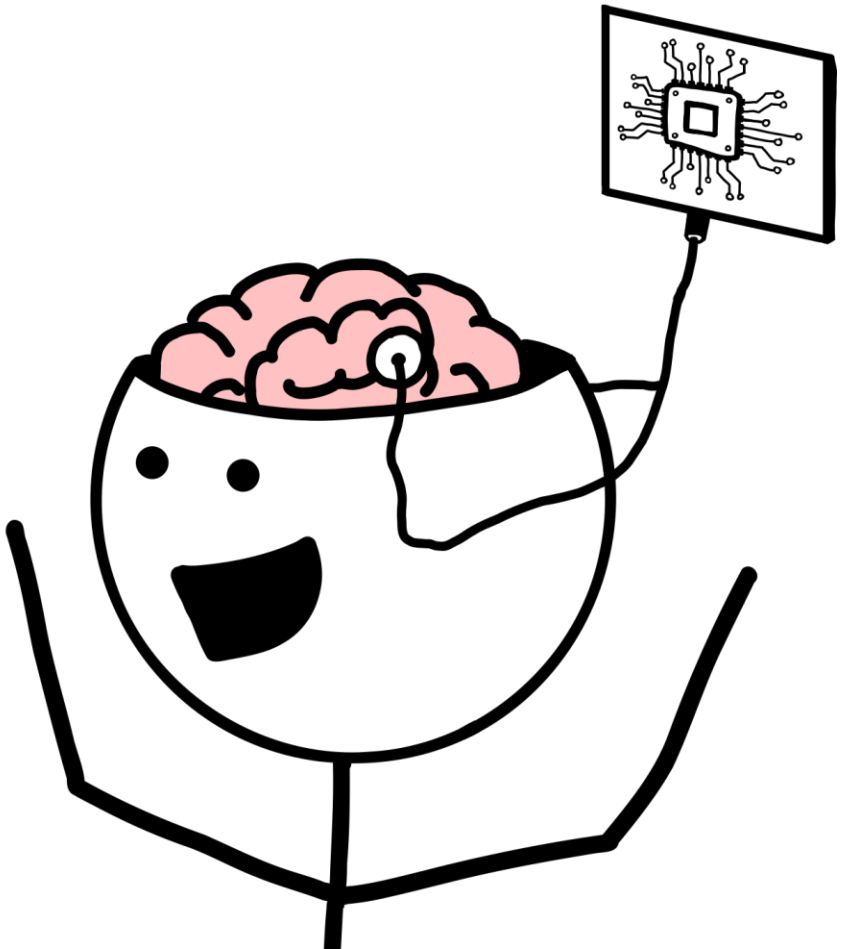
Thank You!



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