Learning From Chaos

“Architecting for Resilience”

or … “How to be Great at Being Wrong”

Russ Miles, CEO, ChaosIQ - @russmiles


SHOEI
TICKETS

What Chaos is *NOT*

Also … a confession.

What is “*Wrong*”?

And why are we ***scared*** of it?

“not correct or true; incorrect.”

“an **injurious**, **unfair**, or **unjust** act”...

…“action or conduct ***inflicting harm without due provocation or just cause***”

“a ***violation*** or ***invasion*** of the ***legal rights*** of another”

When are **we *ever*** wrong?

“the state of being mistaken or incorrect”


I’ve got some bad news for you...


We’re wrong all the time.

Why is wrong ***scary***?

Risk?

Consequences.

Why ***us***?!

Two factors

Feature Velocity

Striving for Reliability

Feature Velocity ***vs.*** Reliability

Good news!

No conflict!

Feature Velocity ***vs.*** Reliability

Feature Velocity + Reliability

But ... ***Microservices***!?

What about ***tests***? ***gates***? ***pipelines***? ***isolation***?

We’re covered…

A Story...

But business is easier...

“One Hour of Downtime Costs > $100K For 95% of Enterprises”

http://itic-corp.com/blog/2013/07/one-hour-of-downtime-costs-100k-for-95-of-enterprises/

“lost revenue and lost end user productivity"

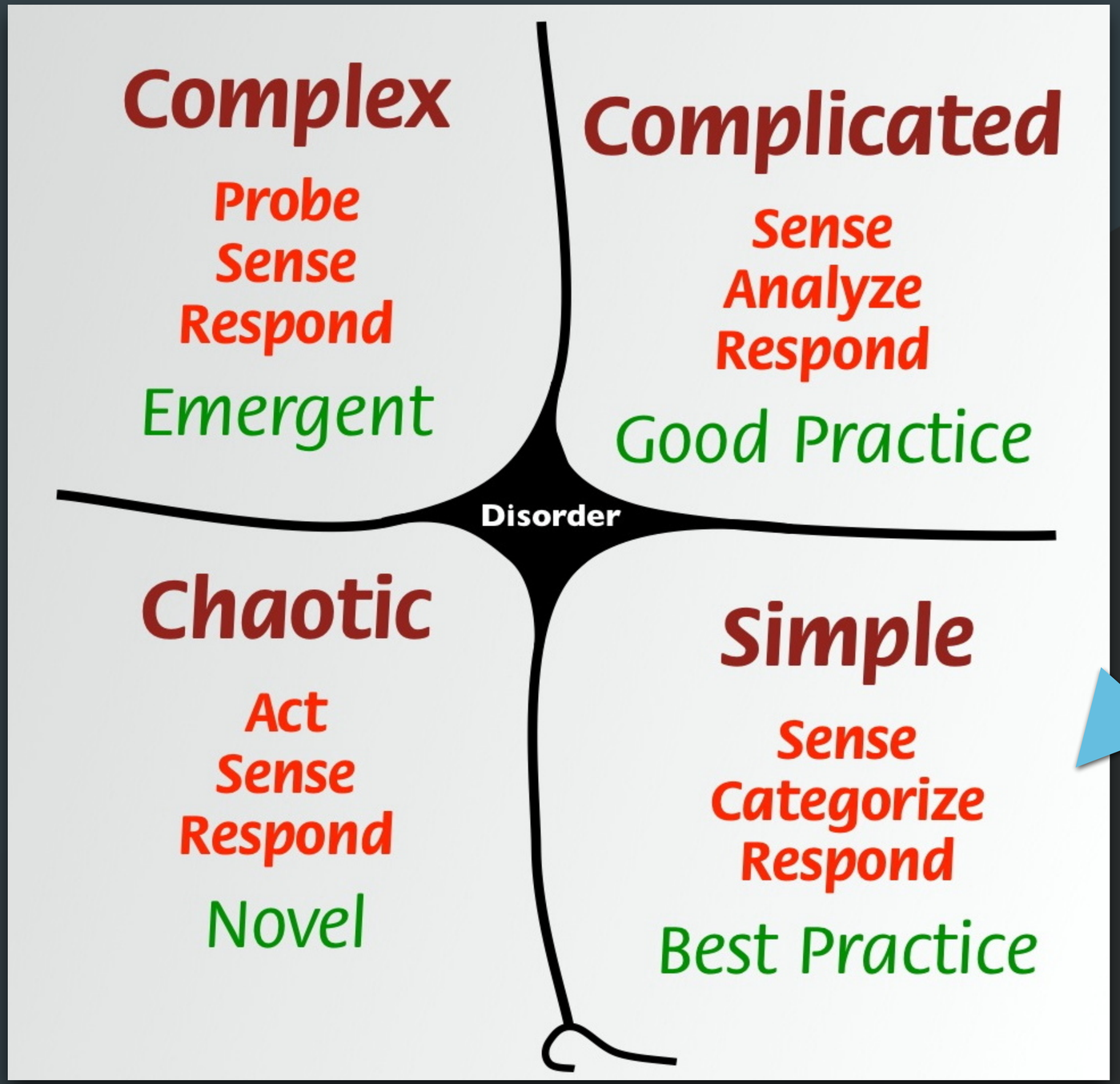
http://itic-corp.com/blog/2013/07/one-hour-of-downtime-costs-100k-for-95-of-enterprises/

“**not take into account** the cost of additional penalties for **regulatory non-compliance** or **“good will” gestures** made to the organization’s customers and business partners that were negatively impacted by a system or network failure. In fact, these two conditions can **cause downtime costs to skyrocket even further**”

http://itic-corp.com/blog/2013/07/one-hour-of-downtime-costs-100k-for-95-of-enterprises/

Feature Velocity + Reliability

Can the problem
be designed out?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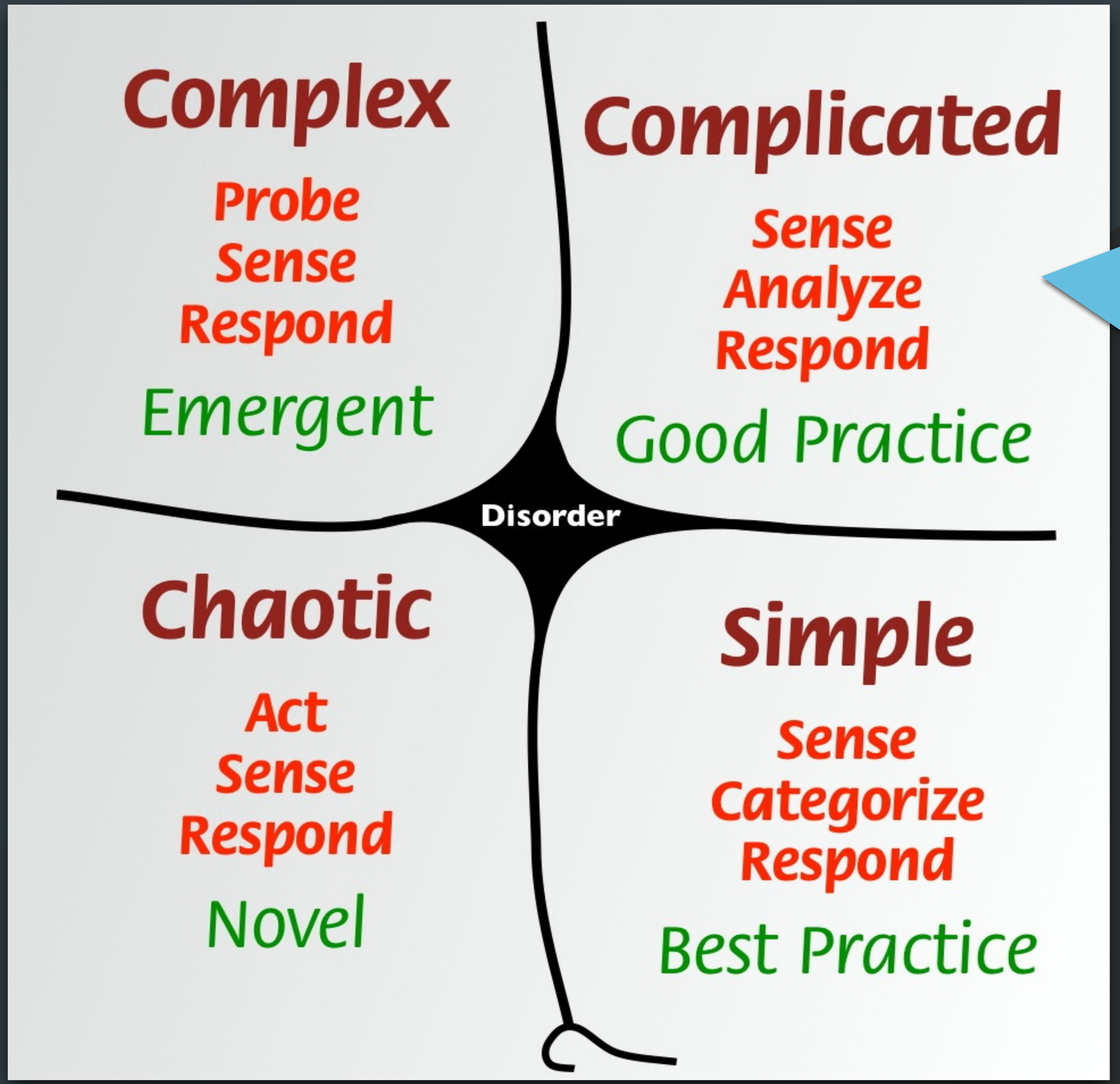
Probe
Sense
Respond
Emergent
Complicated
Sense
Analyze
Respond
Good Practice
Disorder
Chaotic
Act
Sense
Respond
Novel
Simple
Sense
Categorize
Respond
Best Practice
You are
NOT here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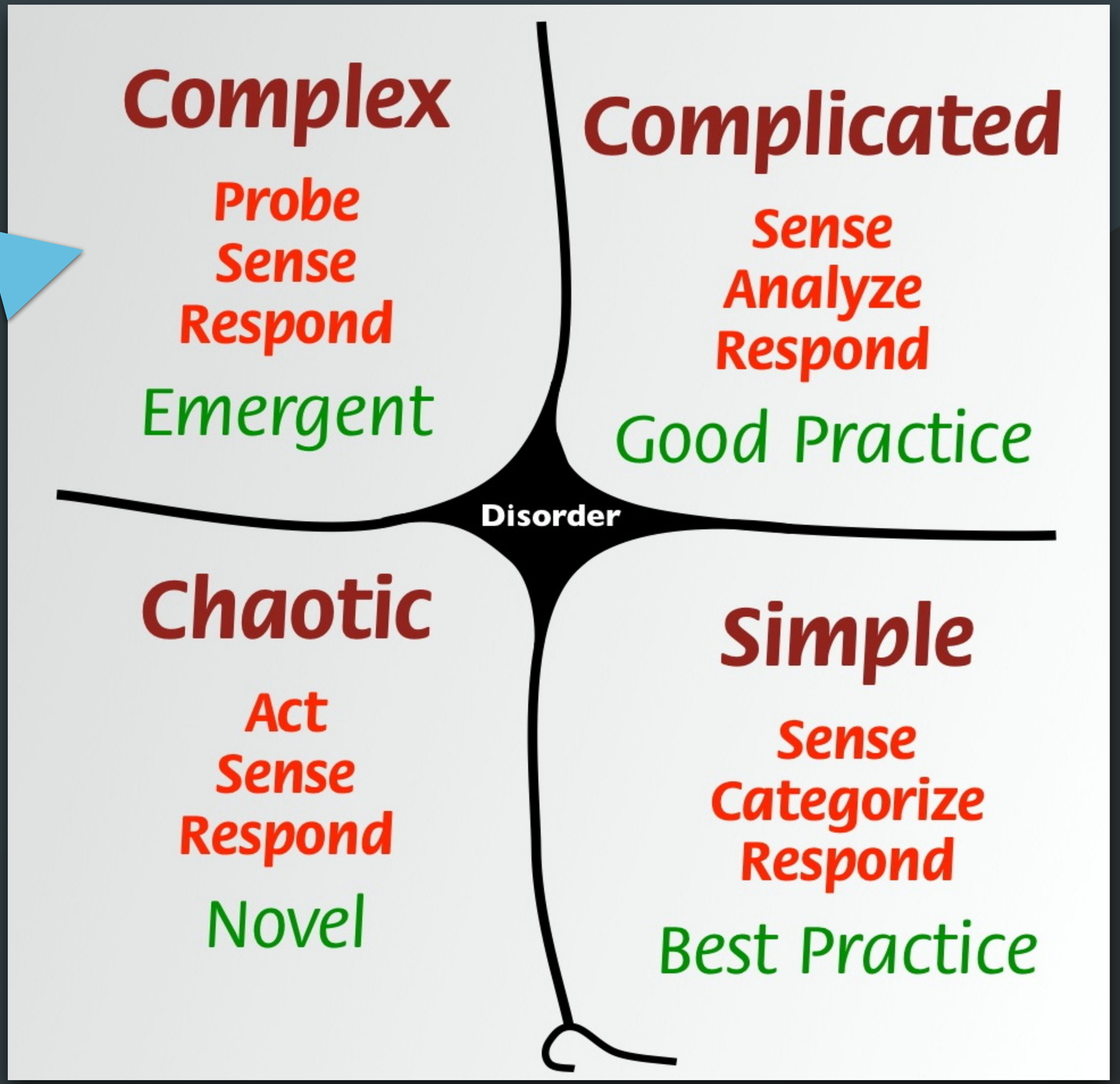
You are here?

Distributed Systems?
External Dependencies?

You are here?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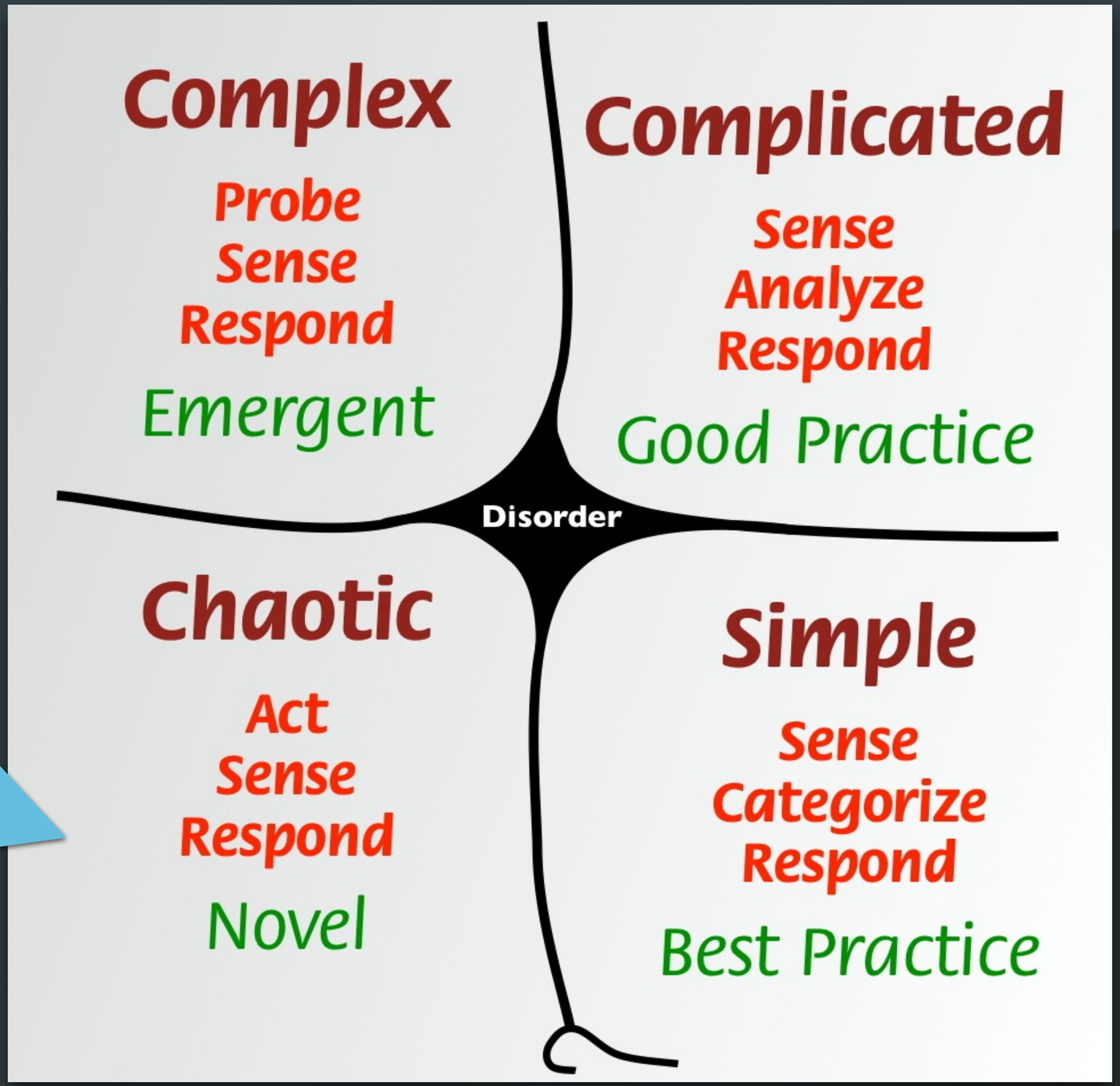
Systems that evolve quickly?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You are here.

Can’t this be ***prevented***?

Essential.

Dark Debt...

Aaron Rinehart and sueallspaw liked

John Allspaw @allspaw · 4h

Reminder that “dark debt” *cannot* be anticipated or prevented. It is a natural byproduct of complexity.

I understand this is uncomfortable, especially for engineers. But that is the concept. If it can be prevented, it’s not “dark debt” - it’s something else.

> Dark debt is found in complex systems and t
> anomalies it generates are complex system
> failures. Dark debt is not recognizable at the
> time of creation. Its impact is not to foil
> development but to generate anomalies. It
> arises from the unforeseen interactions of
> hardware or software with other parts of the
> framework. There is no specific countermeas
> that can be used against dark debt because
> invisible until an anomaly reveals its presenc

4 19 50

What about ***tests***? ***gates***? ***pipelines***? ***isolation***?

Bad news...


You’re not covered

Microservices-based systems tend to look like...

“To be fully described, there are many details, not few”

John Allspaw: https://queue.acm.org/detail.cfm?id=2353017

“The rate of change is high; the systems change before a full description (and therefore understanding) can be completed.”

John Allspaw: https://queue.acm.org/detail.cfm?id=2353017

“How components function is partly unknown, as they resonate with each other across varying conditions.”

John Allspaw: https://queue.acm.org/detail.cfm?id=2353017

“Processes are heterogeneous and possibly irregular.”

John Allspaw: https://queue.acm.org/detail.cfm?id=2353017

Reactions?

Ugly Risk Avoidance!


Blame.

A better reaction?

Being wrong is a key software skill

Get Better At Being Wrong™

Make it Safe(r) to be wrong.

Technical Robustness

Zero Blame

Go ***Beyond Blame***

Remember “Dark Debt”

Deliberately Practice

Being Wrong

“prepare for undesirable circumstances” - John Allspaw

Deliberately Practice
Being Wrong
=
Chaos Engineering

Invest in **Resilience**

Resilience is a

Learning Loop

“Normal”

“Normal”

Outage

“Normal”

Outage

Detection

Diagnosis

Fix

Learning

Fix

Diagnosis

Detection

“Normal”

Outage

Learning

Fix
Diagnosis
Detection

Outage

“Normal”

Improvement
(Robustness)

“Never Let an Outage Go To Waste” - Casey Rosenthal

Post-mortem Learning is Good

Pre-mortem Learning is Better!

“Chaos Engineering is the discipline of ***experimenting*** on a distributed ***system*** in order to build ***confidence*** in the system’s ***capability*** to ***withstand turbulent conditions*** in production.”

- principlesofchaos.org

“Normal”

“Normal”

Game Day /
Automated Chaos Experiment


Fix
Diagnosis
Detection
“Normal”
Game Day /
Automated Chaos Experiment

Learning

Improvement
(Robustness)

“Normal”

Fix
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Game Day /
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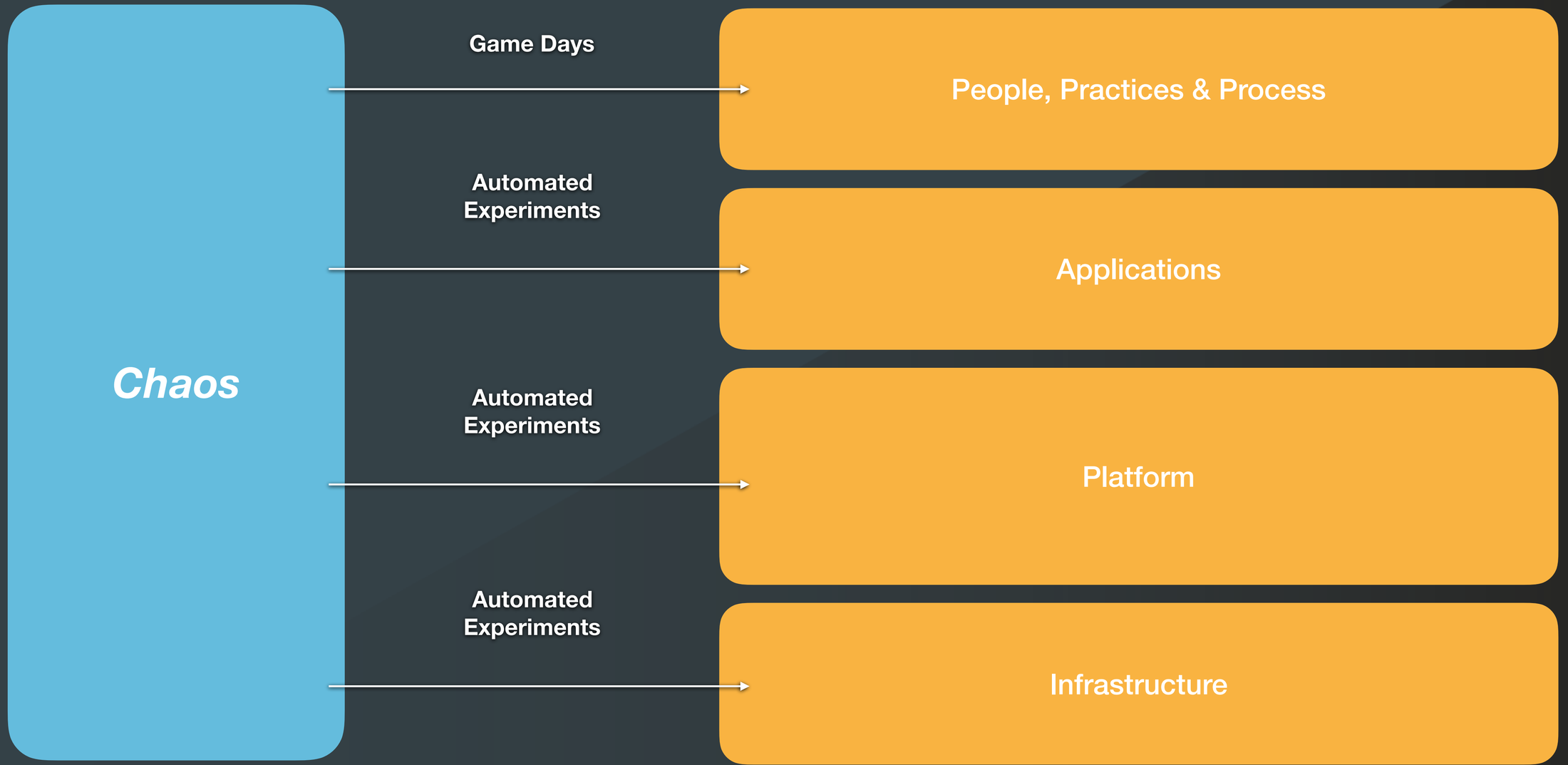

Chaos
Game Days
Automated Experiments
Automated Experiments
Automated Experiments
People, Practices & Process
Applications
Platform
Infrastructure

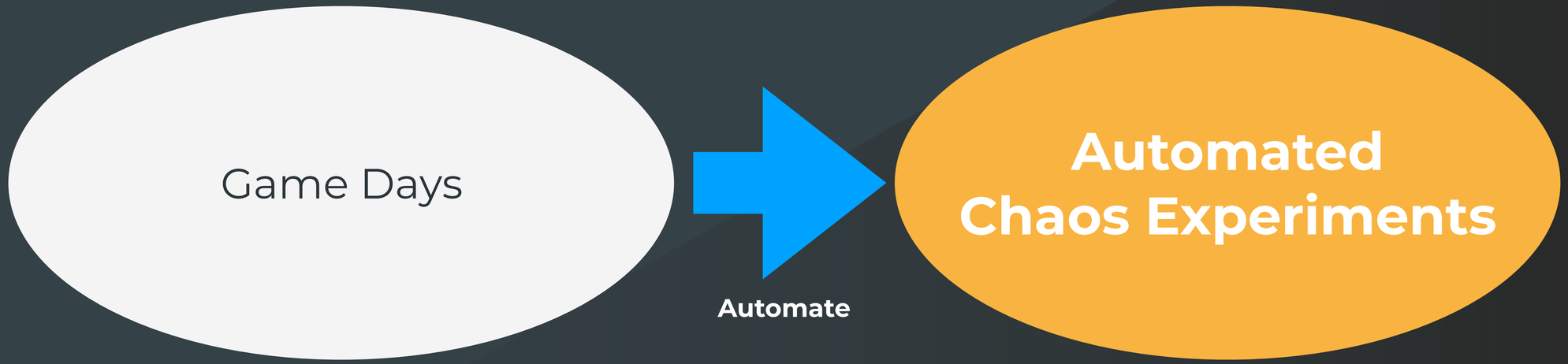
We can ***learn after*** outages...

but it's even better to
learn from weaknesses ***before*** an outage.

Being Wrong can be a super power, if it leads to ***learning***

Establish a Platform for Pre-mortem, Deliberate Practice ***“Being Wrong”***

Establish a Platform for
Pre-mortem, Deliberate Practice
“Chaos Engineering”


Game Days
Automate
Automated
Chaos Experiments

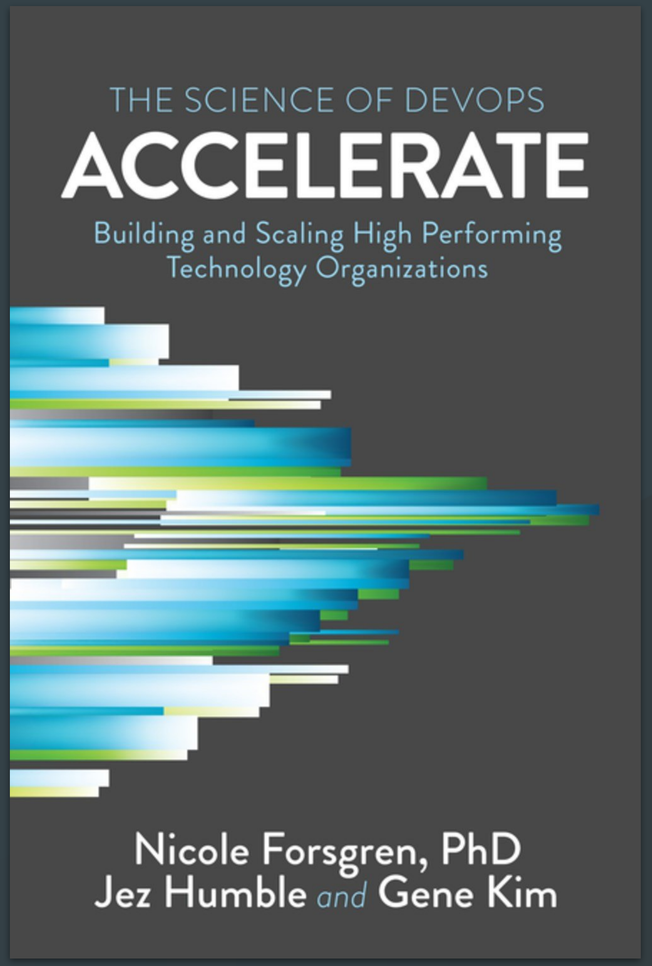
Demo?

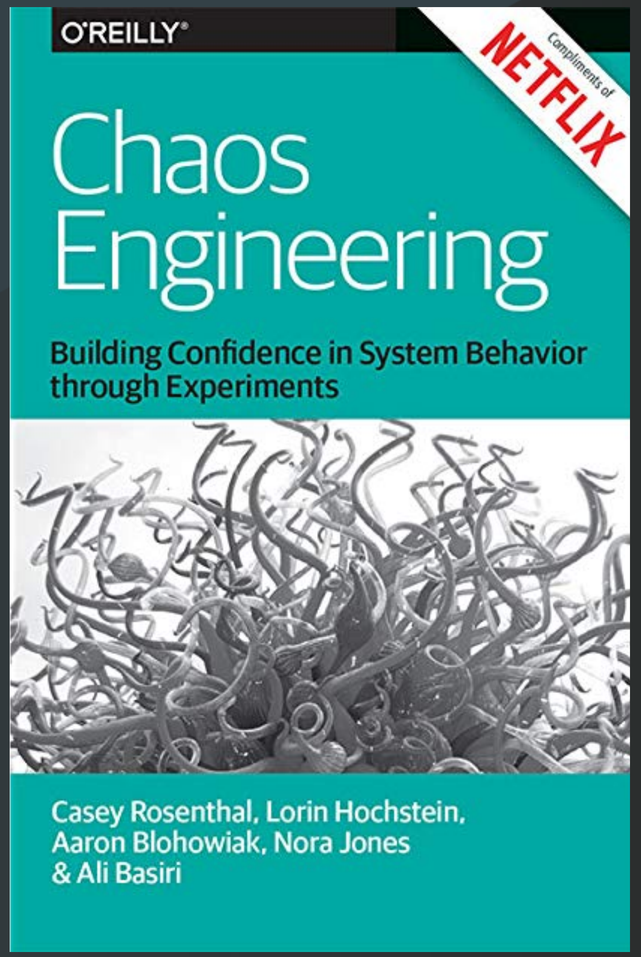
Katacoda

https://katacoda.com/chaostoolkit

https://humio.com/chaos-observability

Reading Recommendations





Start a conversation!

www.chaosiq.io
www.chaostoolkit.org
contact@chaosiq.io
Slack: https://join.chaostoolkit.org