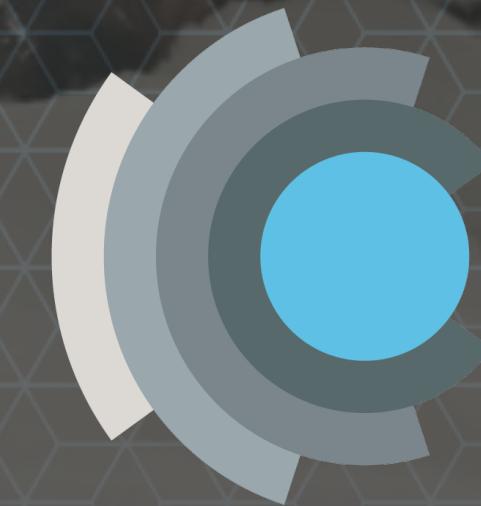


# How to be Wrong

or ... “How to be Great at Being Wrong”

Russ Miles - @russmiles





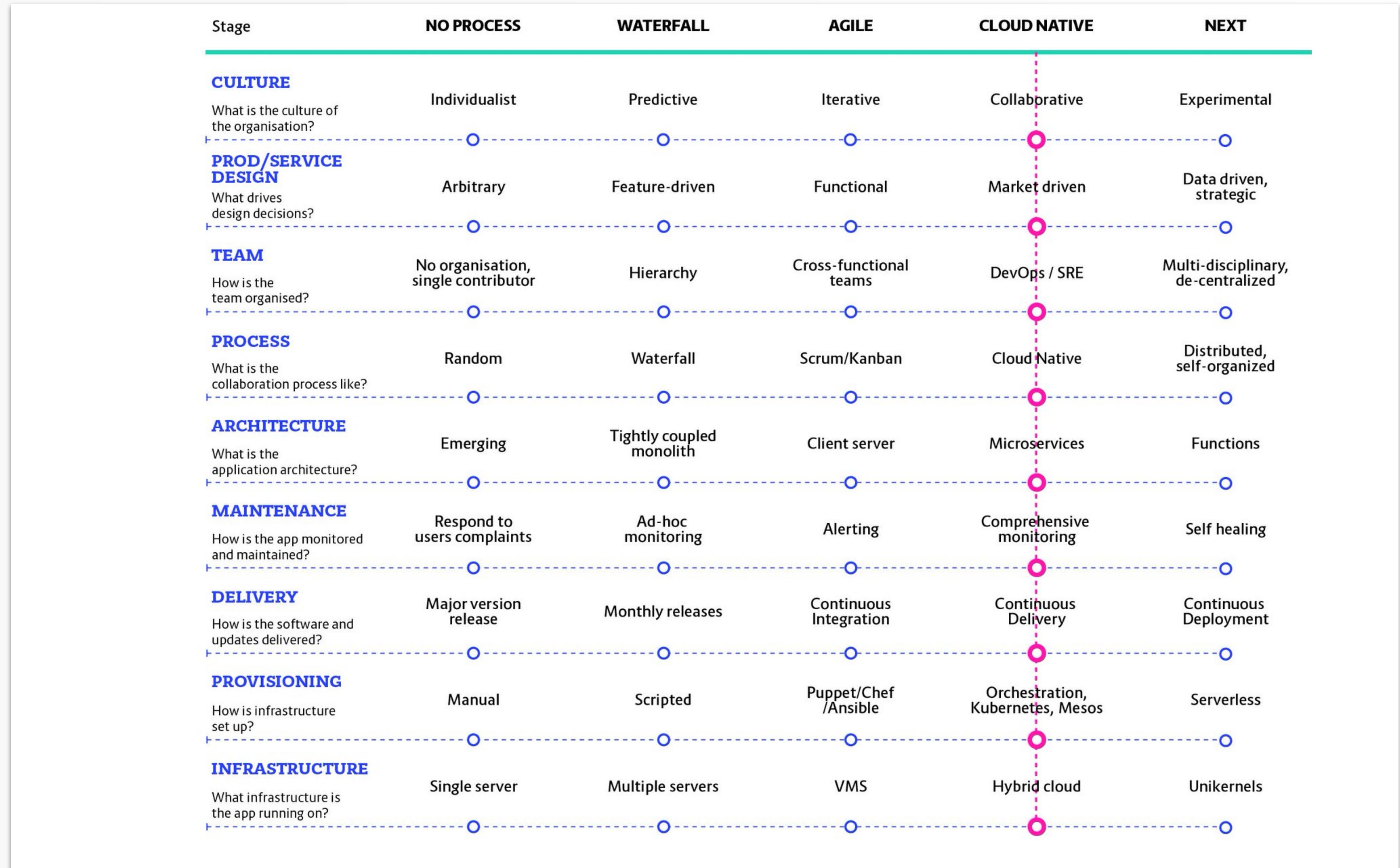






We're going **(insert latest trend here)!**

So, what's the **problem**?



And even when you “get there”...



THE NIGHT IS DARK AND  
FULL OF TERRORS

Why?



Photo by Nikolas Noonan on Unsplash

# **COMPLEX**

PROBE - SENSE - RESPOND

Emergent

# **CHAOTIC**

ACT - SENSE - RESPOND

Novel

# **COMPLICATED**

SENSE - ANALYZE - RESPOND

Good Practice

# **OBVIOUS**

SENSE - CATEGORIZE - RESPOND

Best Practice

DISORDER

# COMPLEX

PROBE - SENSE - RESPOND

Emergent

# CHAOTIC

ACT - SENSE - RESPOND

Novel

DISORDER

# COMPLICATED

SENSE - ANALYZE - RESPOND

Good Practice

YOU ARE NOT HERE

# OBVIOUS

SENSE - CATEGORIZE - RESPOND

Best Practice

# COMPLEX

PROBE - SENSE - RESPOND

Emergent

# CHAOTIC

ACT - SENSE - RESPOND

Novel

DISORDER

# COMPLICATED

SENSE - ANALYZE - RESPOND

Good Practice

ARE YOU HERE?

# OBVIOUS

SENSE - CATEGORIZE - RESPOND

Best Practice

Distributed systems?

External dependencies?

# COMPLEX

PROBE - SENSE - RESPOND

Emergent

ARE YOU HERE?

# CHAOTIC

ACT - SENSE - RESPOND

Novel

# COMPLICATED

SENSE - ANALYZE - RESPOND

Good Practice

DISORDER

# OBVIOUS

SENSE - CATEGORIZE - RESPOND

Best Practice

Systems that evolve quickly?

# COMPLEX

PROBE - SENSE - RESPOND

Emergent

YOU ARE HERE

# CHAOTIC

ACT - SENSE - RESPOND

Novel

# COMPLICATED

SENSE - ANALYZE - RESPOND

Good Practice

DISORDER

# OBVIOUS

SENSE - CATEGORIZE - RESPOND

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SENSE - CATEGORIZE - RESPOND

Best Practice

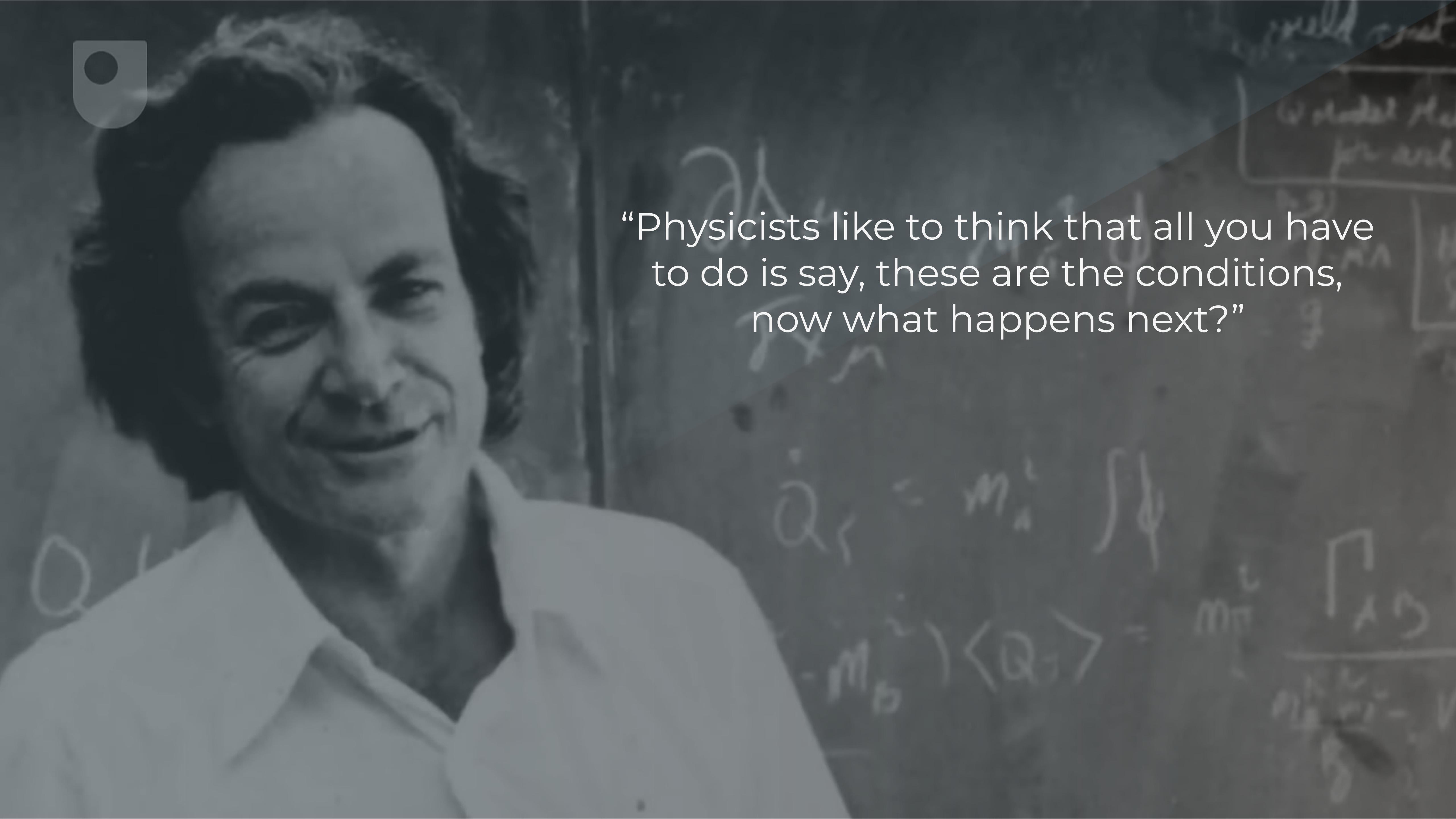


“The things that change the world, according to Chaos theory, are the tiny things. A butterfly flaps its wings in the Amazonian jungle, and subsequently a storm ravages half of Europe.”

Good Omens,  
Terry Pratchett and Neil Gaiman

You're working with **non-linear, dynamic systems...**

And you want them to **know** they **work**...



“Physicists like to think that all you have to do is say, these are the conditions, now what happens next?”

But... “Incidents”

# 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”

A close-up photograph of a man with dark hair and a beard, wearing a white medical coat over a blue and white striped shirt. He has a stethoscope around his neck. He is looking directly at the camera with a serious expression and his hands are raised in front of him, palms facing up, as if he is about to reveal something important.

I've got some bad news for you...

A painting depicting two men in a room. One man, wearing a dark cap and a patterned shirt, is leaning forward, looking down at a book he is holding. The other man, wearing a light-colored shirt, is standing behind him, also looking at the book. The room has wooden paneling.

We're wrong all the time.

# October 21 post-incident analysis

Oct 30, 2018

jasoncwarner

Engineering

Last week, GitHub experienced [an incident](#) that resulted in degraded service for 24 hours and 11 minutes. While portions of our platform were not affected by this incident, multiple internal systems were affected which resulted in our displaying of information that was out of date and inconsistent. Ultimately, no user data was lost; however manual reconciliation for a few seconds of database writes is still in progress. For the majority of the incident, GitHub was also unable to serve webhook events or build and publish GitHub Pages sites.

All of us at GitHub would like to sincerely apologize for the impact this caused to each and every one of you. We're aware of the trust you place in GitHub and take pride in building resilient systems that enable our platform to remain highly available. With this incident, we failed you, and we are deeply sorry. While we cannot undo the problems that were created by GitHub's platform being unusable for an extended period of time, we can explain the events that led to this incident, the lessons we've learned, and the steps we're taking as a company to better ensure this doesn't happen again.

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Why is wrong **scary**?

# Risk?

# Consequences.

# Why **us**?

# Two factors

# Feature Velocity

# Striving for Reliability

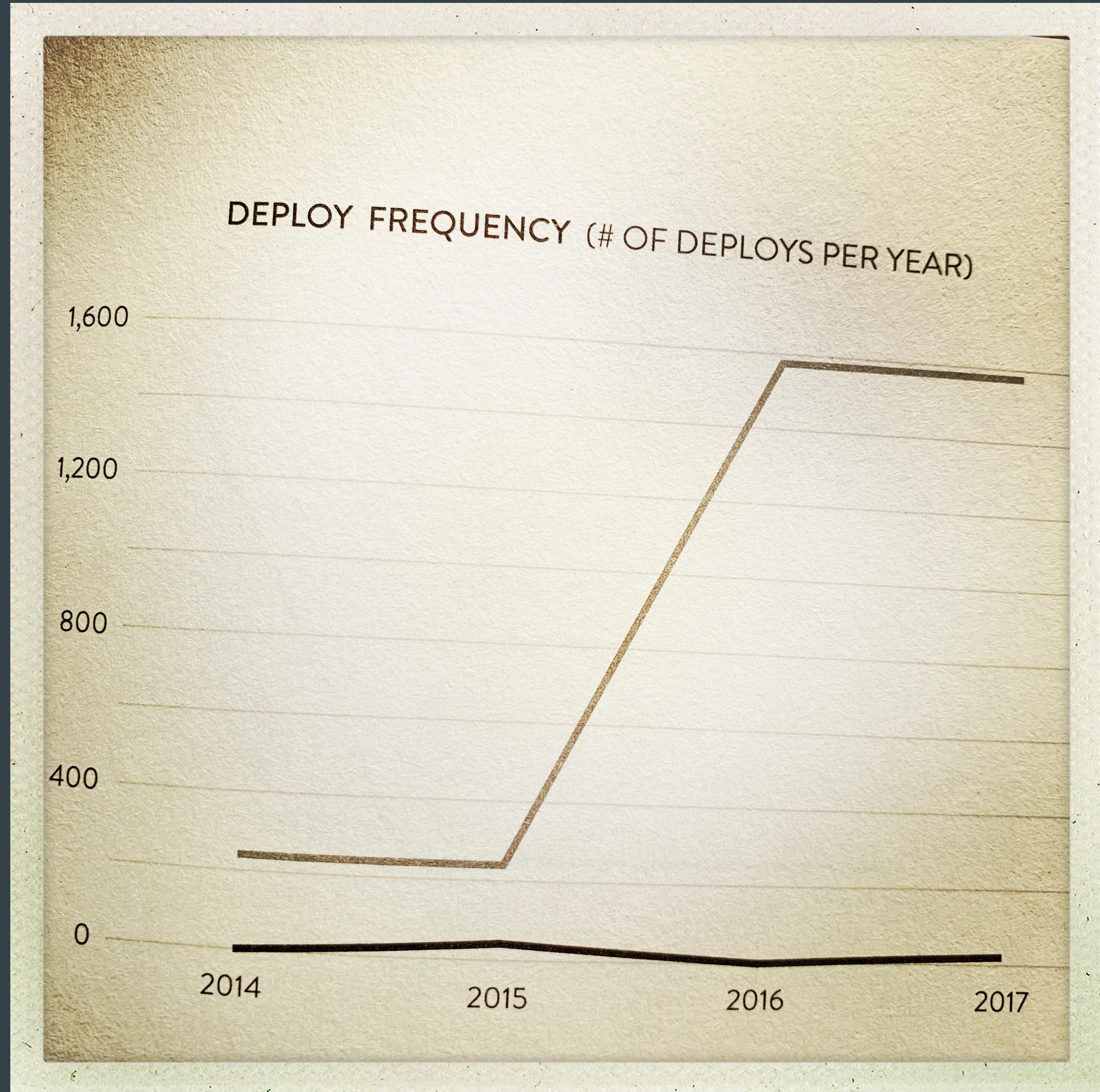
# Feature Velocity **VS.** Reliability

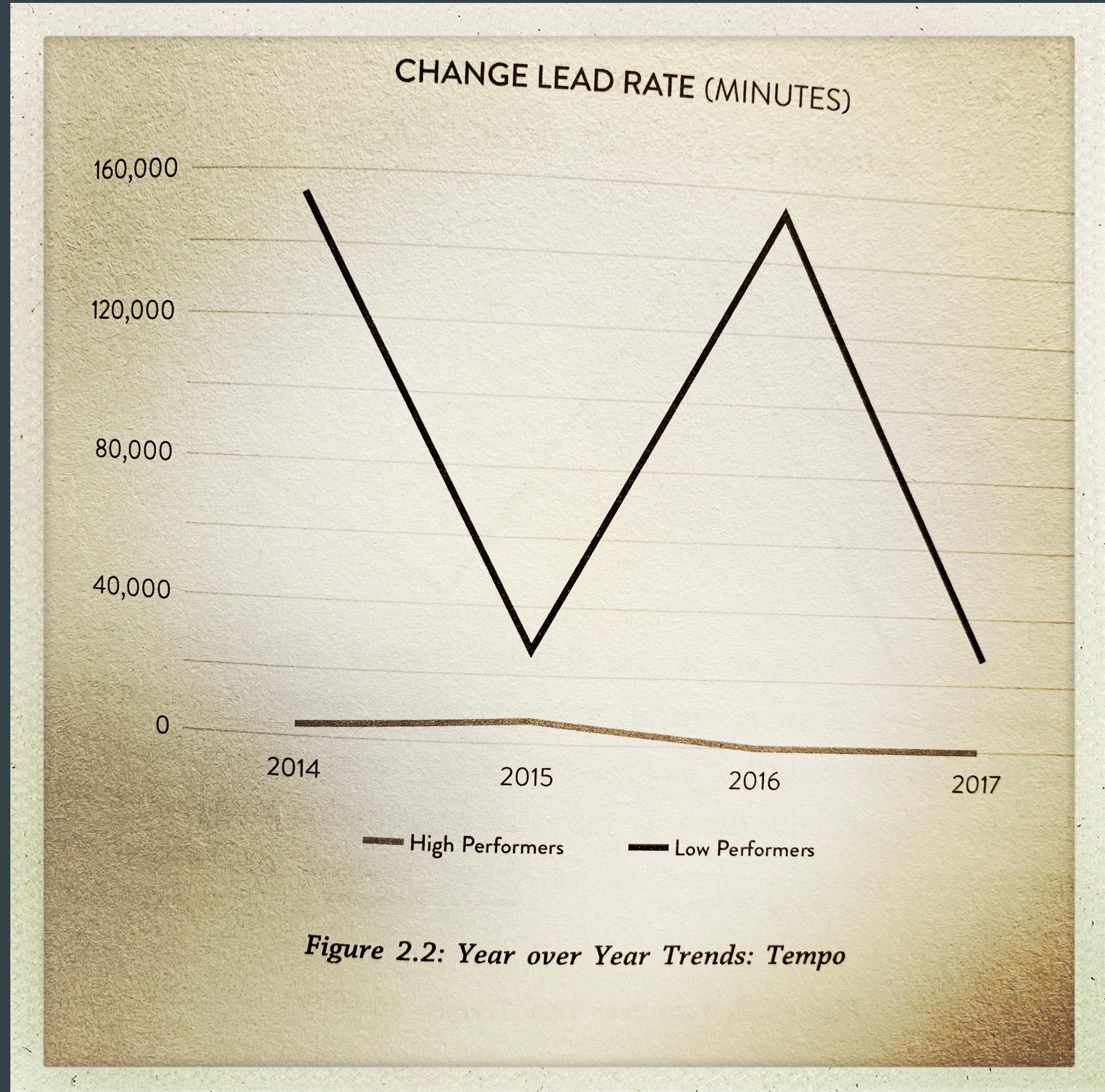
# Good news!

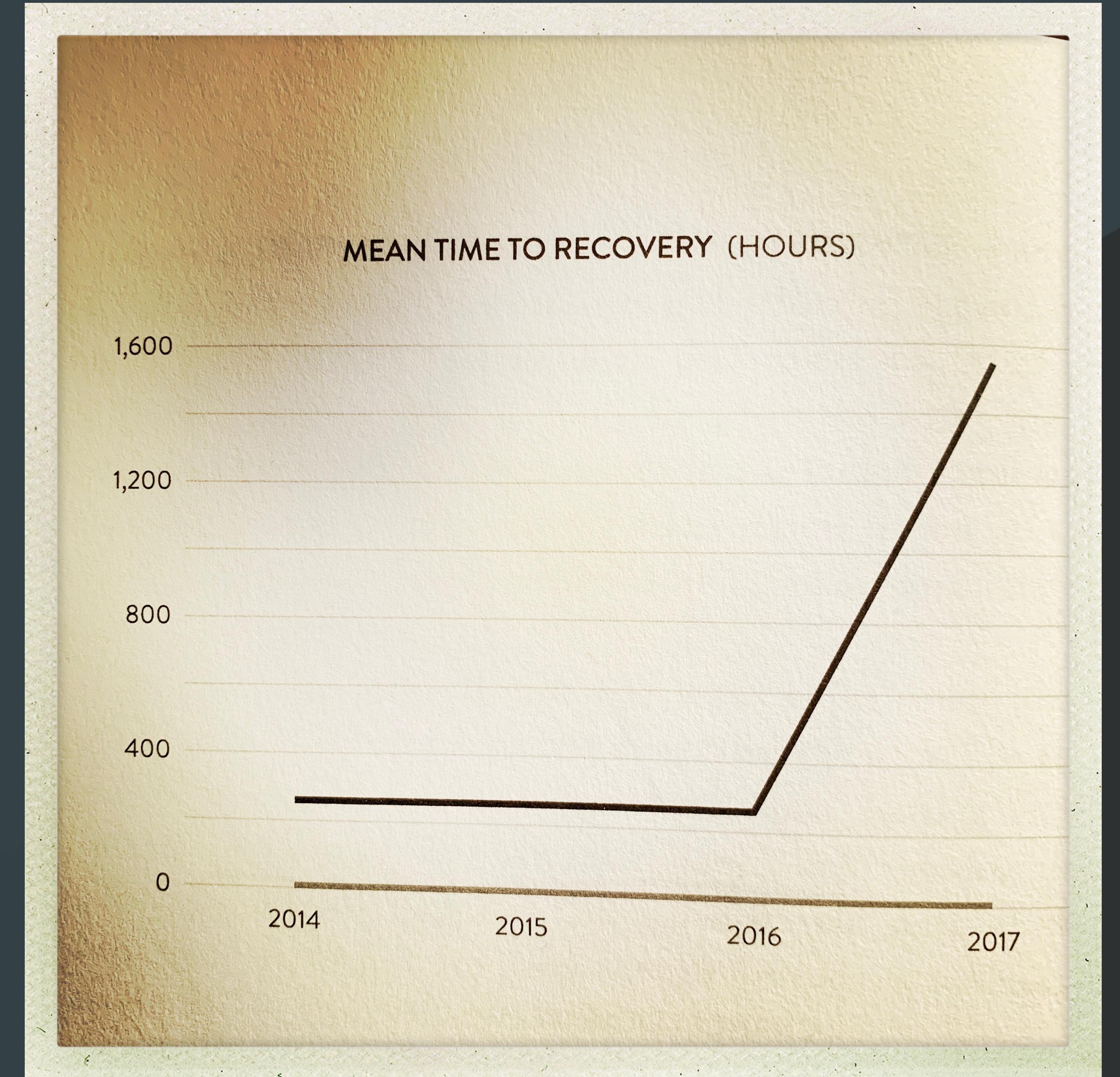
# No conflict!

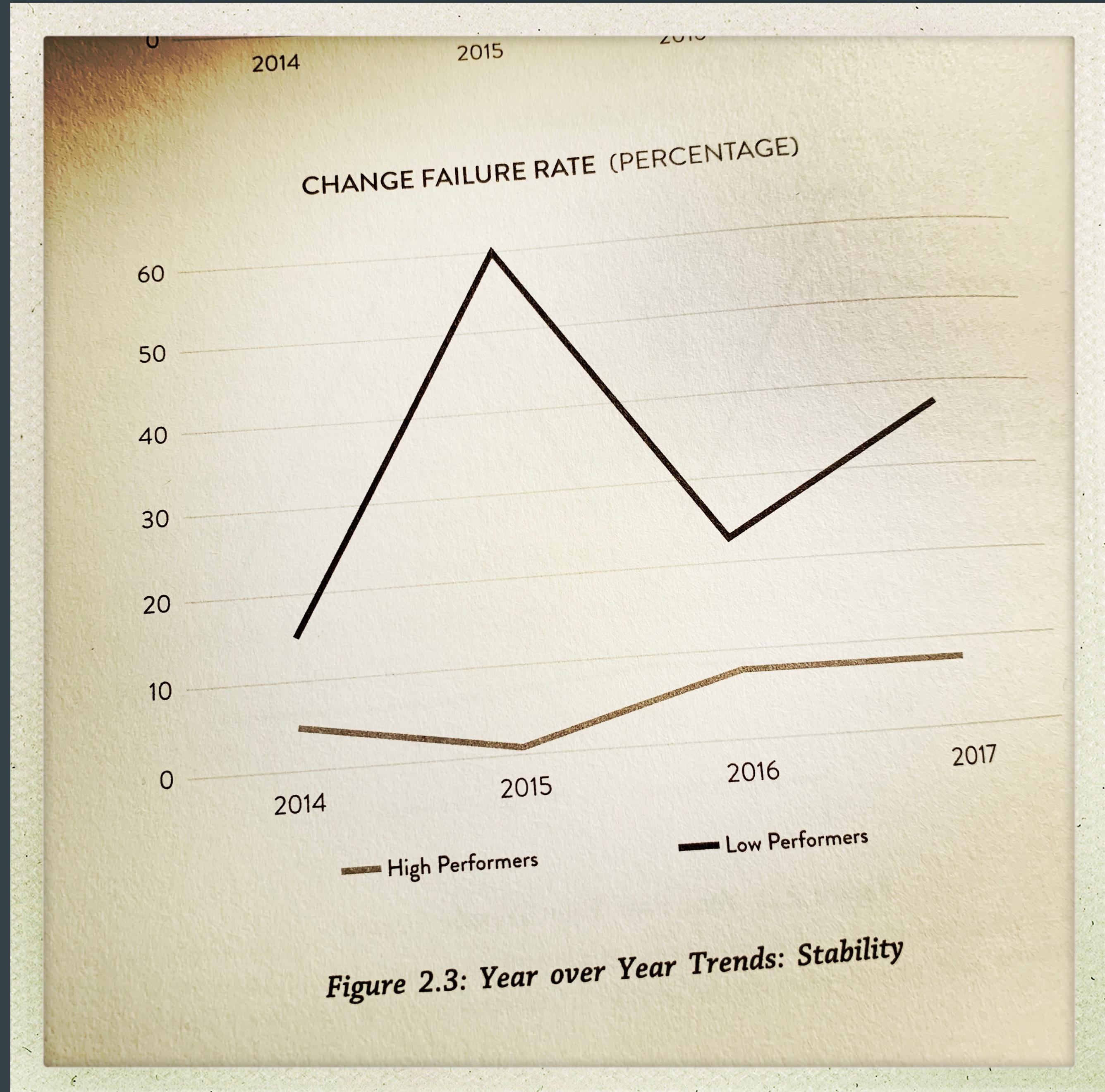
# Feature Velocity **VS.** Reliability

# Feature Velocity + Reliability



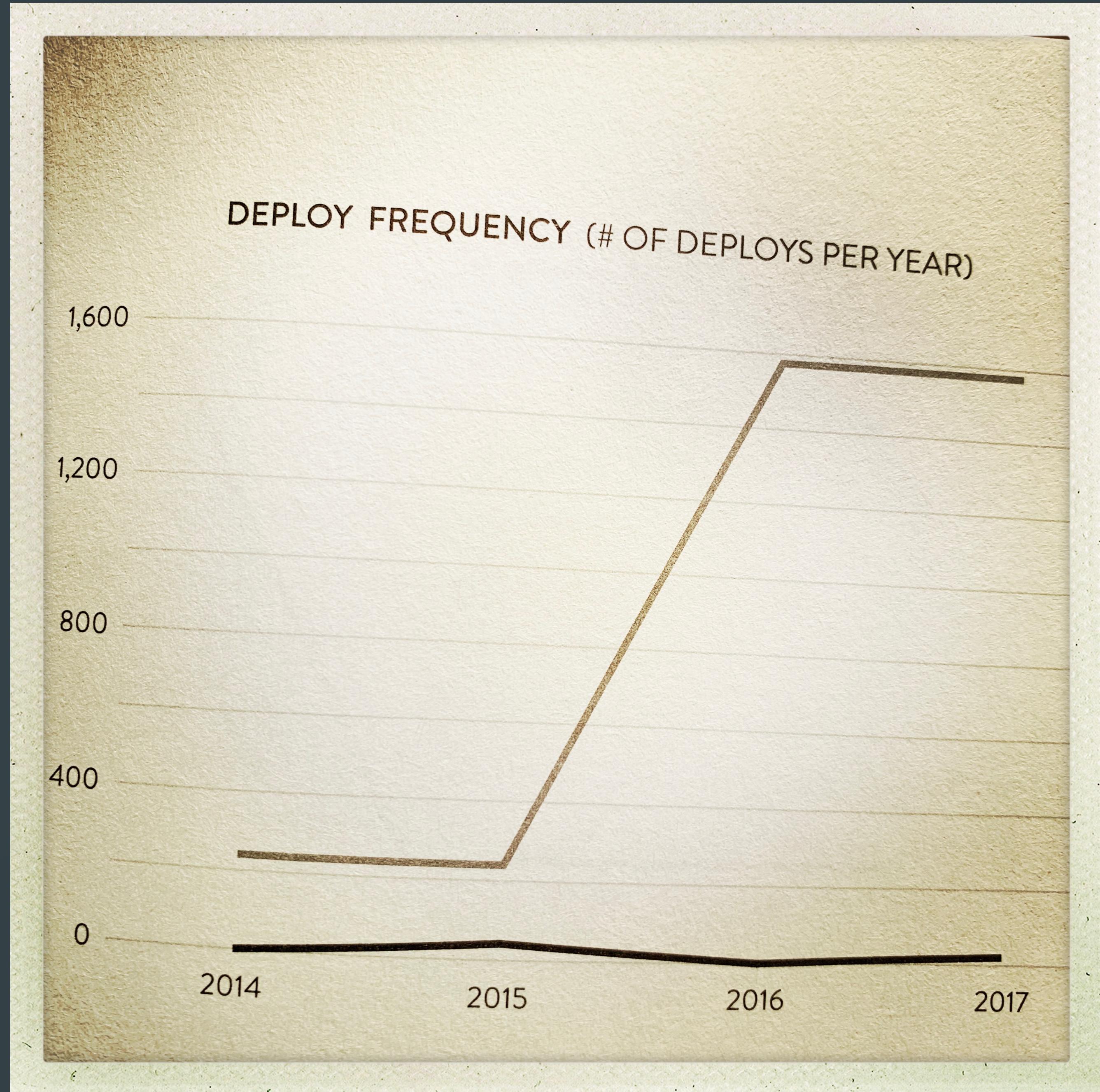


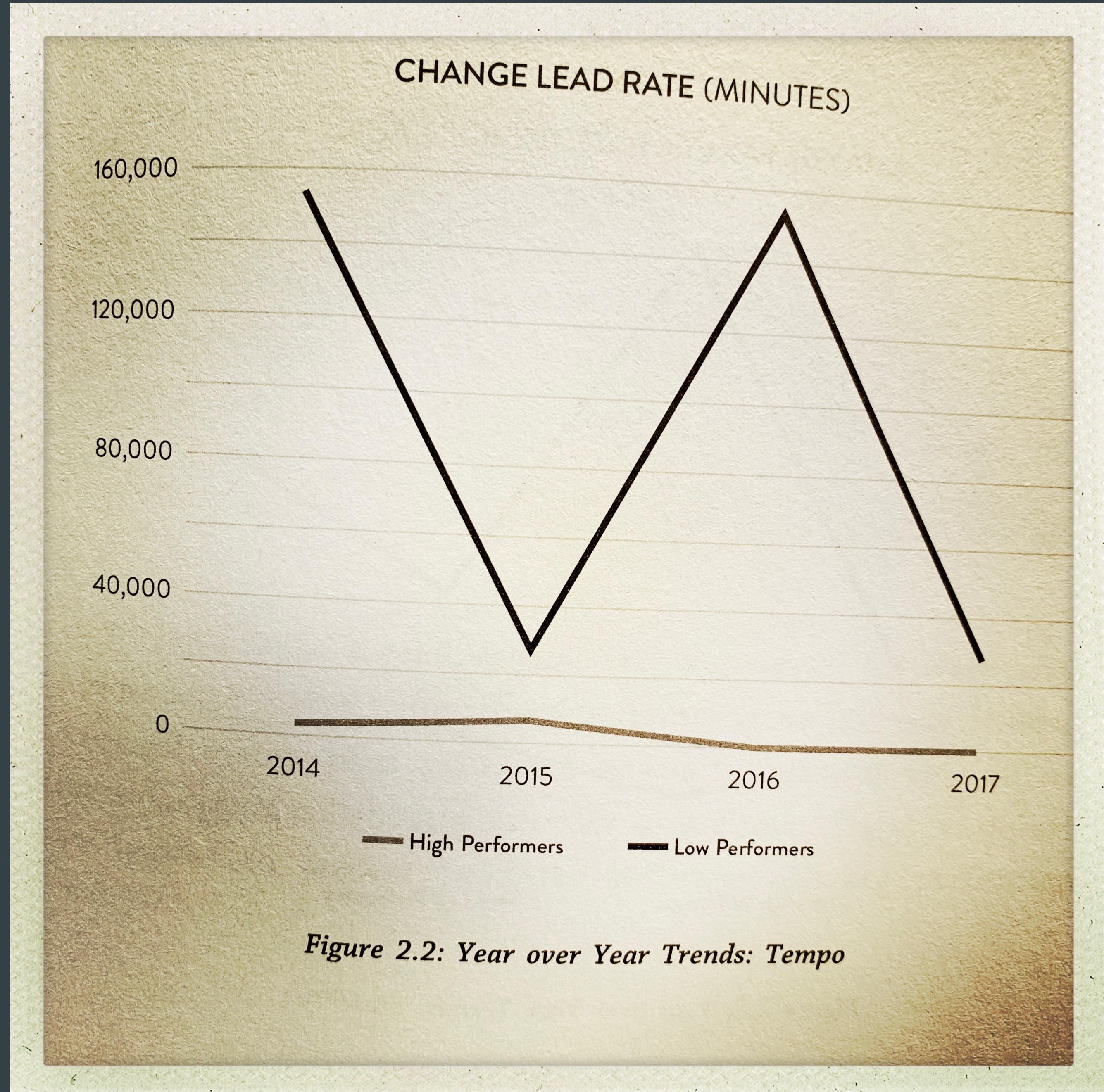


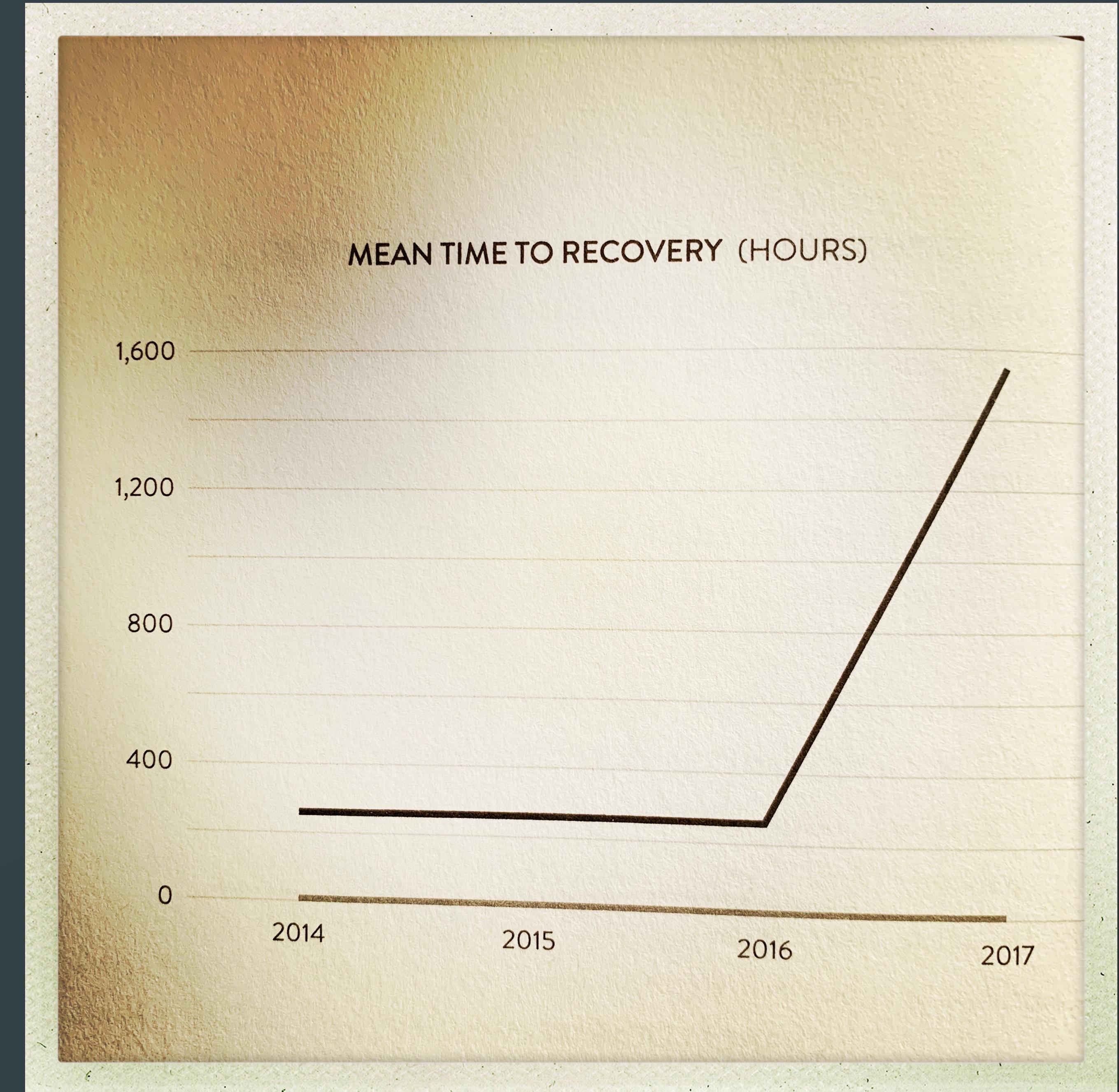


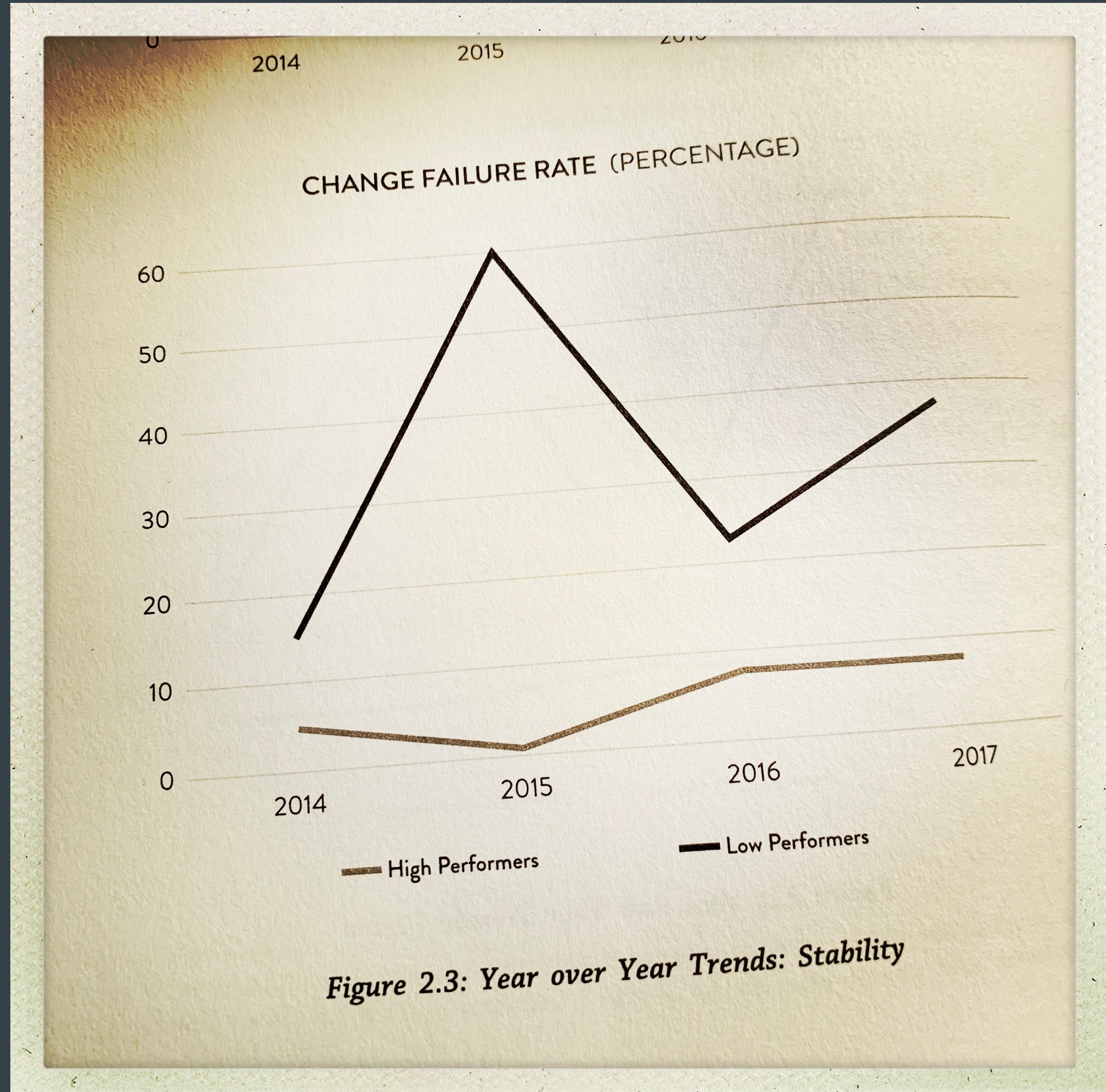
# Feature Velocity **VS.** Reliability

# Feature Velocity + Reliability









But ... *Microservices!*?

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

Paid for by the  
Donald J. Trump Exploratory Committee

We're covered...



A Story...







And it gets worse...



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 the 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 countermeasure that can be used against dark debt because it is invisible until an anomaly reveals its presence.

4

19

50

↑

And over to the business...

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

*“lost revenue and lost end user productivity”*

**“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”**

Bad news...

A close-up, slightly blurred portrait of Donald Trump. He has his hands clasped near his face, with his fingers resting against his cheeks and forehead. He is wearing a dark suit jacket, a white shirt, and a red tie. The background is dark and out of focus.

You're not covered



Microservices-based systems  
tend to look like...

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

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

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

“Processes are heterogeneous  
and possibly irregular.”

# Reactions?

# Ugly Risk Avoidance!

A dark, moody photograph of a man and a woman in profile, facing each other. The man, on the left, has short hair and is wearing a dark jacket over a light shirt. He is pointing his right index finger directly at the woman's chest. The woman, on the right, has long dark hair pulled back and is wearing a dark top. She is looking down and slightly away from the man, with her hands clasped in front of her. The background is a soft-focus grey.

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*

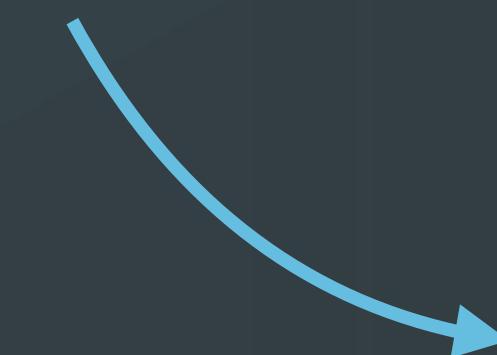


*Invest in Resilience*

Resilience is a  
*Learning Loop*

“Normal”

“Normal”



Outage

“Normal”



Outage

Fix  
Diagnosis  
Detection



Learning

“Normal”

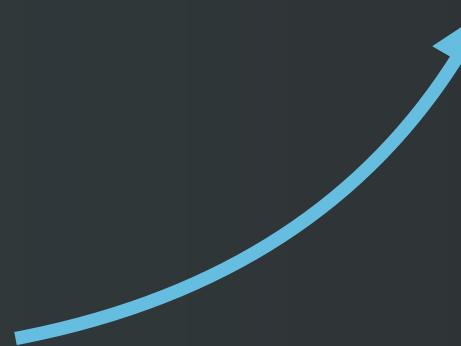


Outage

Fix

Diagnosis

Detection





Learning

Improvement  
(Robustness)

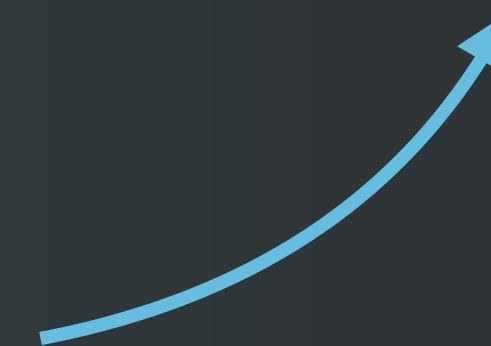
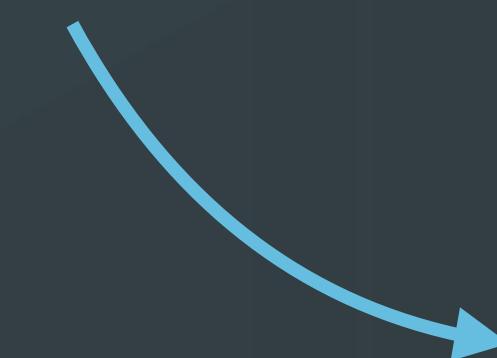
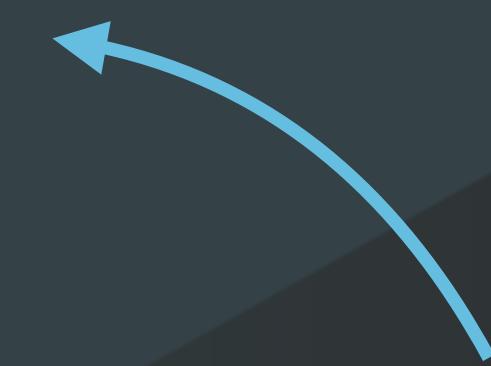
“Normal”



Outage

Fix  
Diagnosis

Detection



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



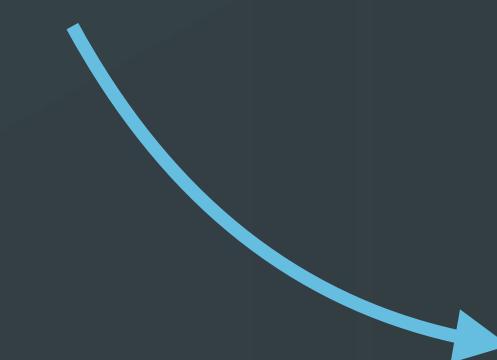
*Post-mortem Learning*  
is Good

*Pre-mortem Learning  
is Better!*

“Chaos Engineering is the discipline of  
***experimenting*** on a ***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

“Normal”

Fix  
Diagnosis  
Detection





Learning

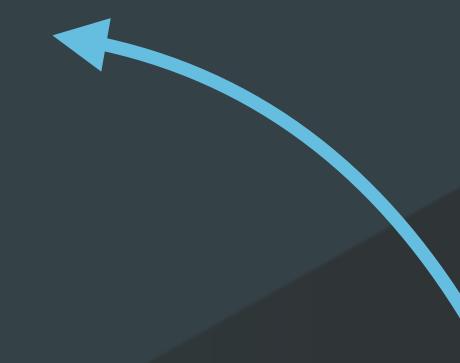
Improvement  
(Robustness)

“Normal”

Fix  
Diagnosis  
Detection



Game Day /  
Automated Chaos Experiment



*Chaos*

Game Days

People, Practices & Process

Automated Experiments

Applications

Automated Experiments

Platform

Automated Experiments

Infrastructure

We can *learn after* outages...

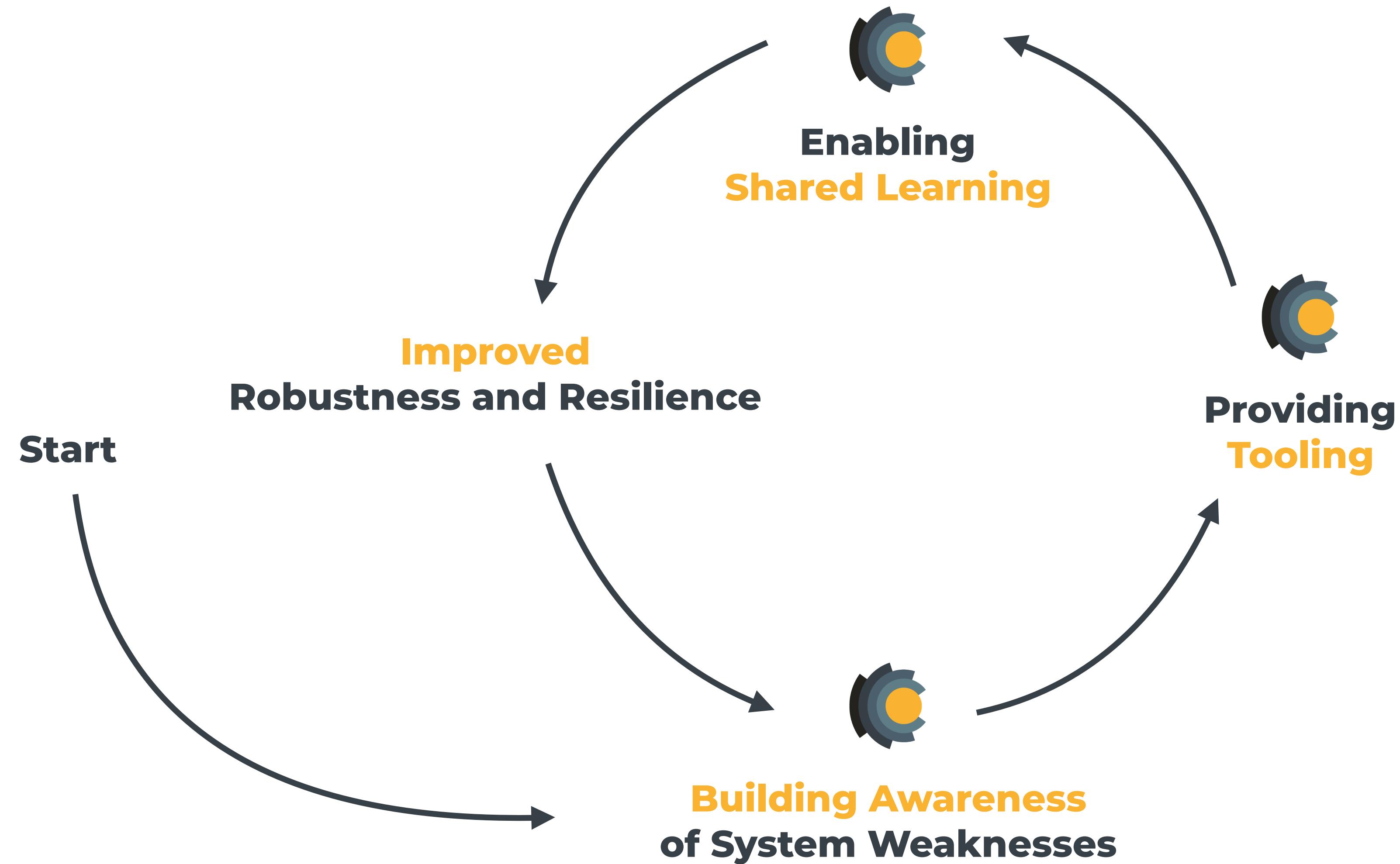
but it's even better to  
**learn** from weaknesses **before** an outage.

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

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

Establish your own Platform for  
Pre-mortem, Deliberate Practice  
***“Chaos Engineering”***

Successful Chaos Engineers enable an investment in resiliency and reliability by:



Chaos Toolkit: [chaostoolkit.org](http://chaostoolkit.org)  
[join.chaostoolkit.org](http://join.chaostoolkit.org)  
and...

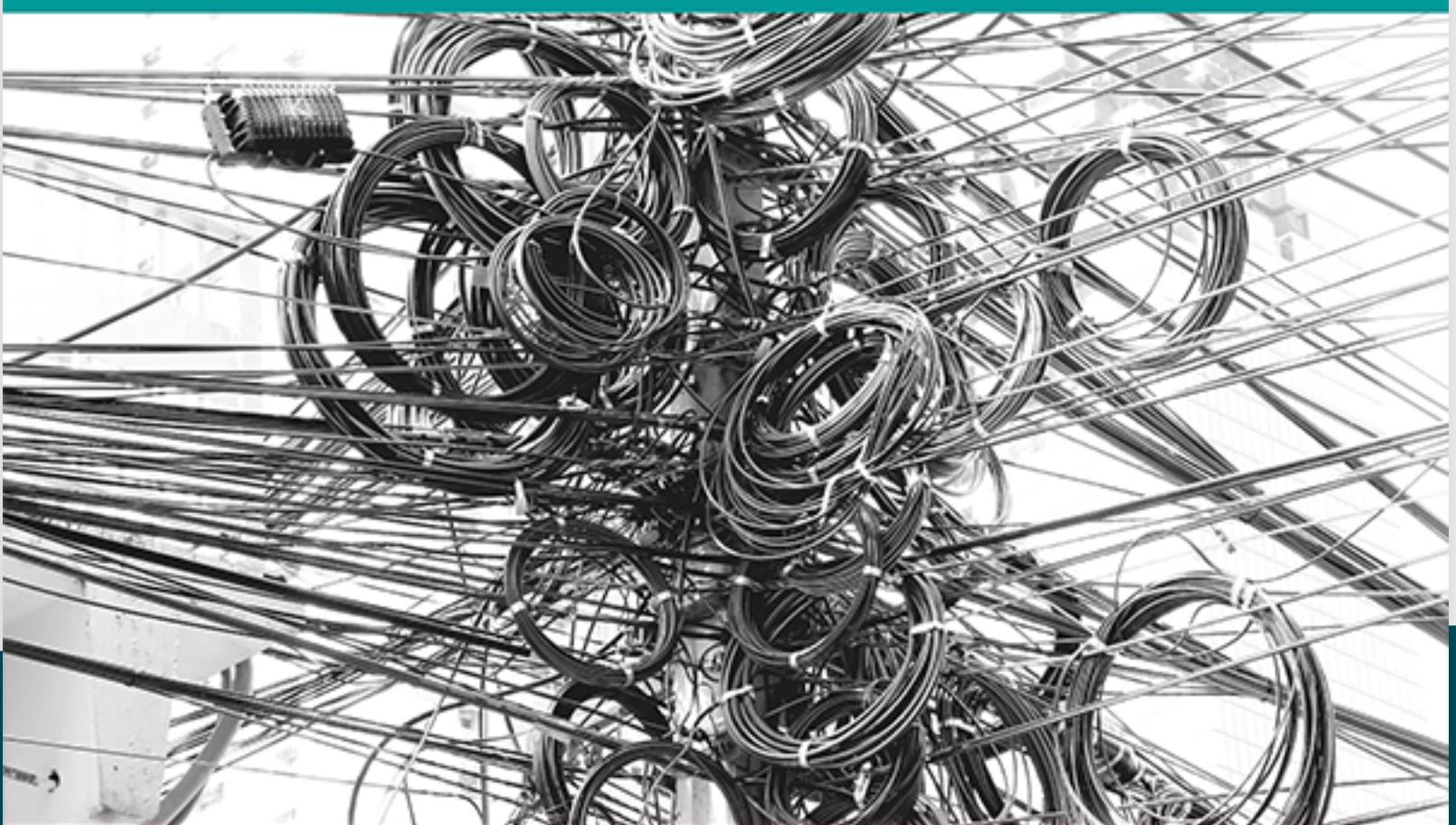
# ChaosIQ ready for Early Access!

Lastly ... Futures...

O'REILLY®

# Chaos Engineering Observability

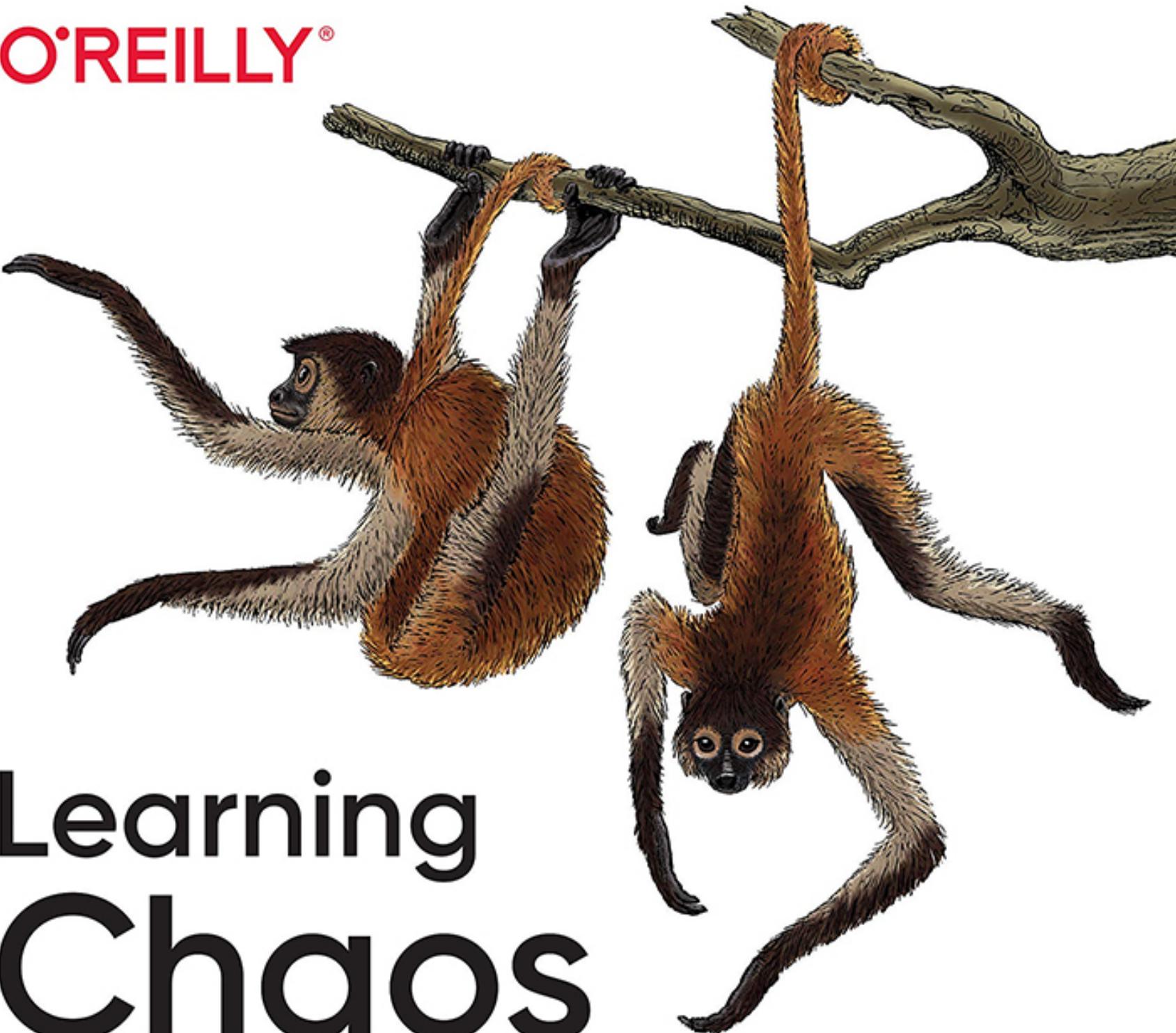
Bringing Chaos Experiments into  
System Observability



Russ Miles

Compliments of  
 HUMIO

O'REILLY®



# Learning Chaos Engineering

Discovering and Overcoming System  
Weaknesses through Experimentation

Russ Miles

# Thanks for Attending

Russ Miles | @russmiles | <https://www.linkedin.com/in/russmiles/>

