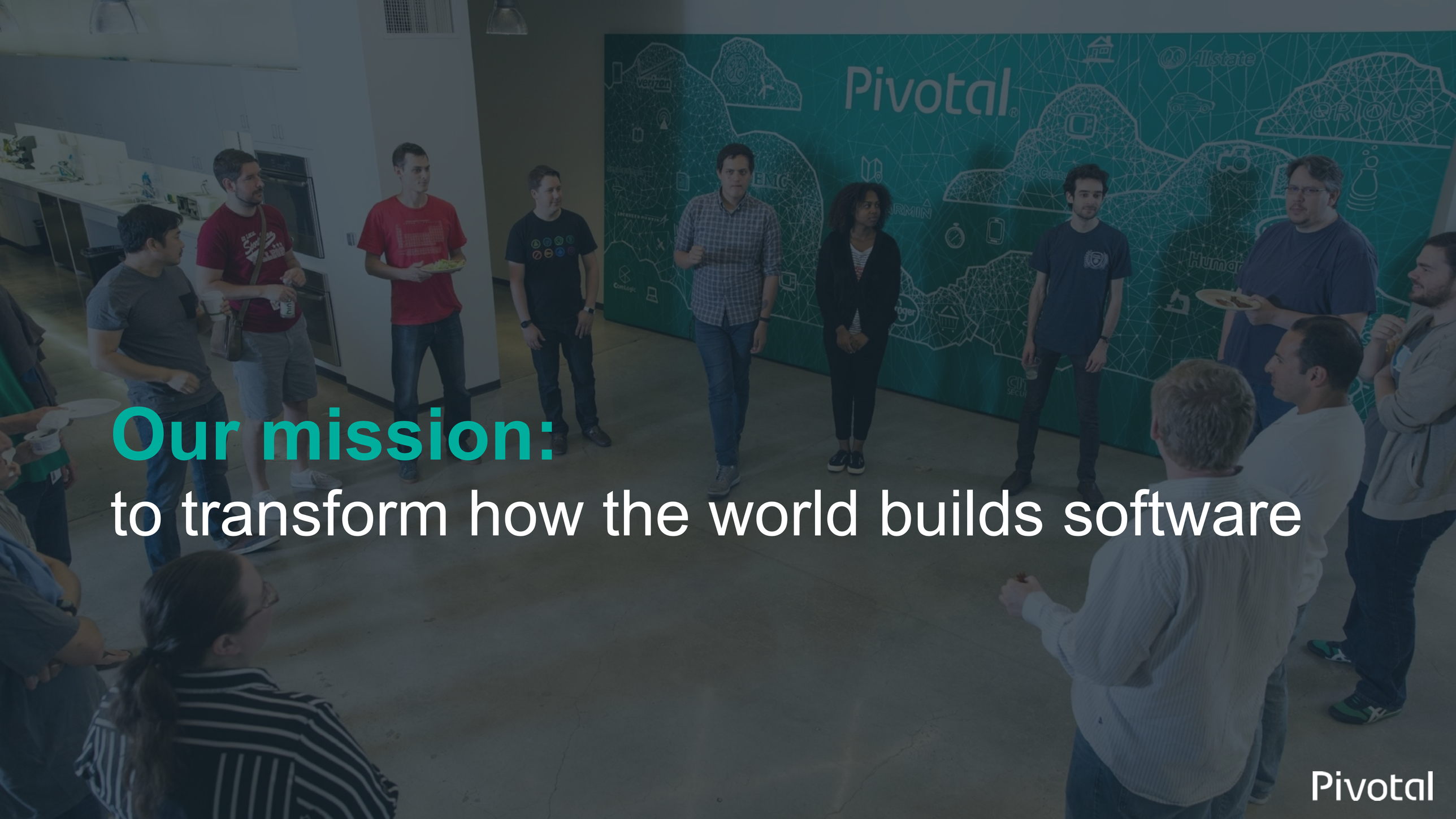
elemental devops

Andrew Clay Shafer
@littleidea

Pivotal™

北京



Our mission:

to transform how the world builds software

Pivotal

Why do you need to be good at software?

Customers expect it.

Meet the demands to operate at scale.

Give you more business options.

Your competitors are improving.

It makes your life better.

Pivotal

What keeps you from being good at software?

It’s hard to experiment and quickly incorporate what you learn.

Stuck with incomplete or outdated application platforms.

Hostile processes and procedures make it painful to ship software.

Organization silos have competing priorities.

The transformation is real.

T-Mobile goes from **7 months and 72 steps** to update software, to **same day deployments**.

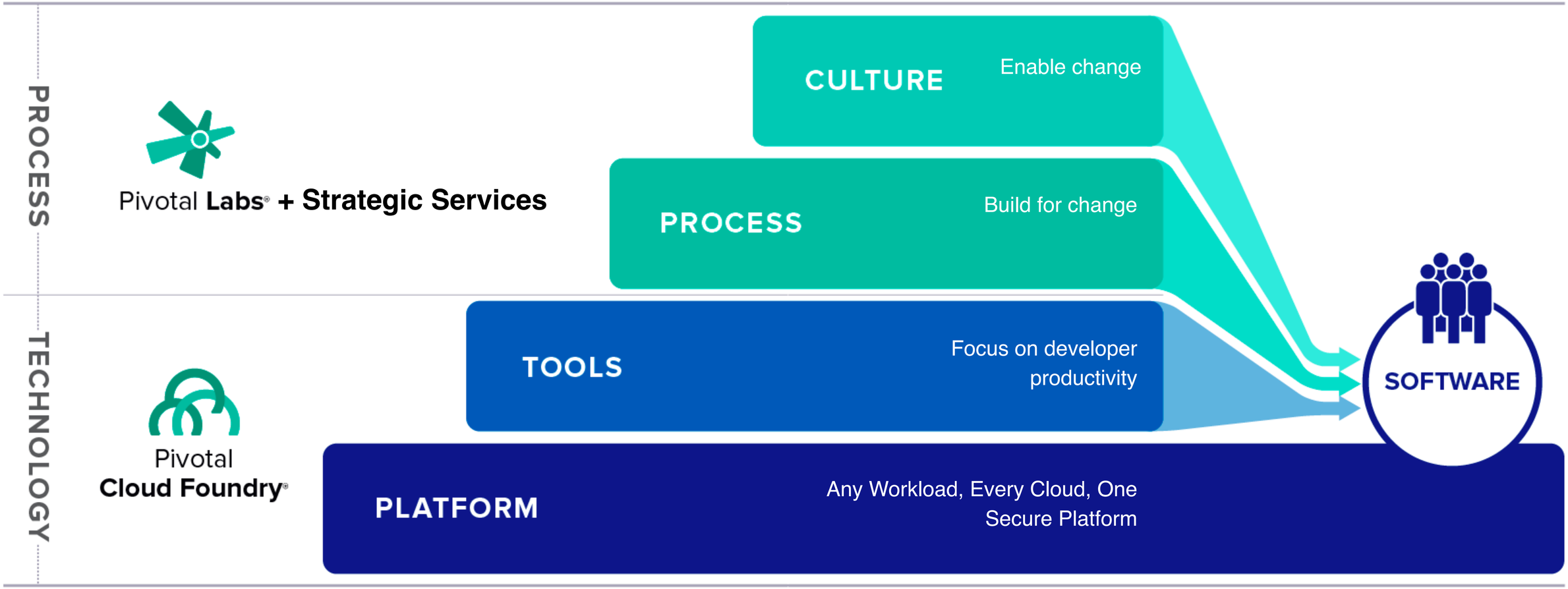
Liberty Mutual **builds and deploys an MVP in one month** and delivers revenue-generating version just hours later.

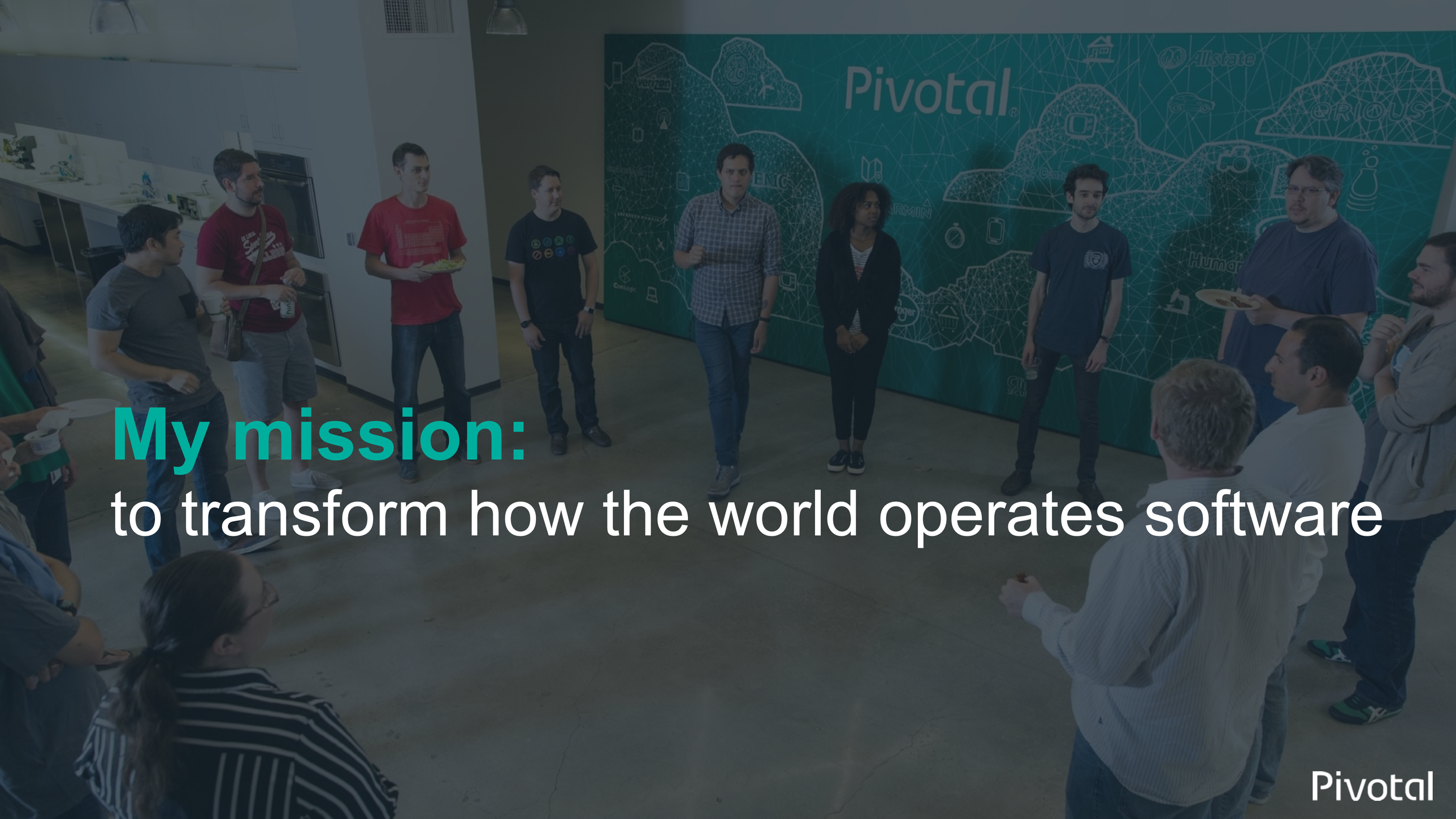
The Home Depot **ships to production 1,500 times a month**, and 17,000 times a month to all environments.

Comcast supports over 1500 developers with an **operator team of 4 people**.

Express Scripts went from **45 days** to patch one product in nine environments, to **five days**.

Pivotal

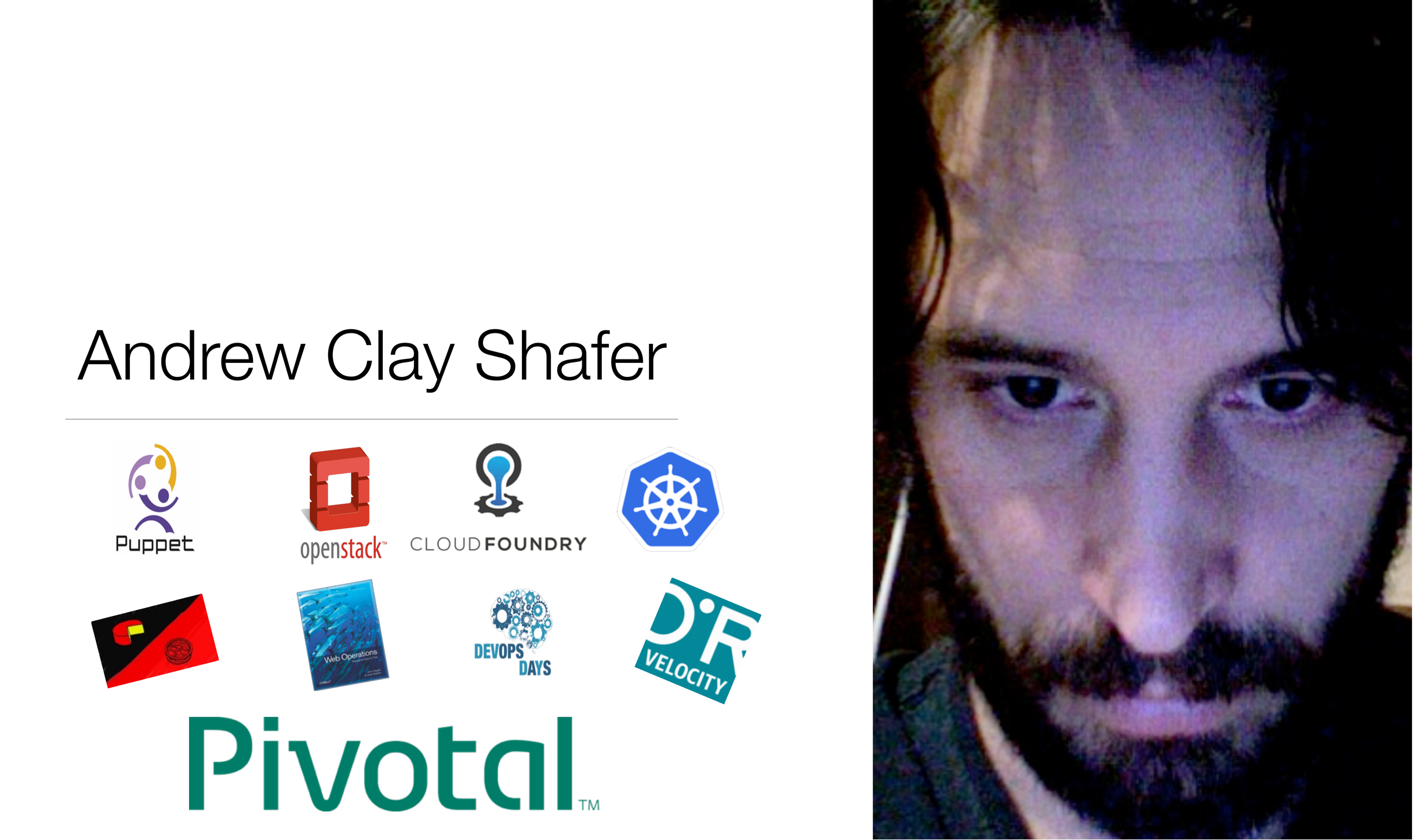

PROCESS
TECHNOLOGY
Pivotal Labs® + Strategic Services
Pivotal Cloud Foundry®
CULTURE
Enable change
PROCESS
Build for change
TOOLS
Focus on developer productivity
PLATFORM
Any Workload, Every Cloud, One Secure Platform
SOFTWARE



My mission:

to transform how the world operates software

Andrew Clay Shafer



Andrew Clay Shafer

@littleidea

Andrew Clay Shafer

@littleidea


IBM

most important devops stuff

- Learn to Read
- Learn to Write
- Learn to Speak
- Follow @littleidea on Twitter

tl;dr

the way to improve dev…

is improve ops…

tl;dr

the way to improve ops…

is improve dev…

but why?

who cares?

One Word…

SOFTWARE

tl;dr

you are building a software company

or losing to someone who is

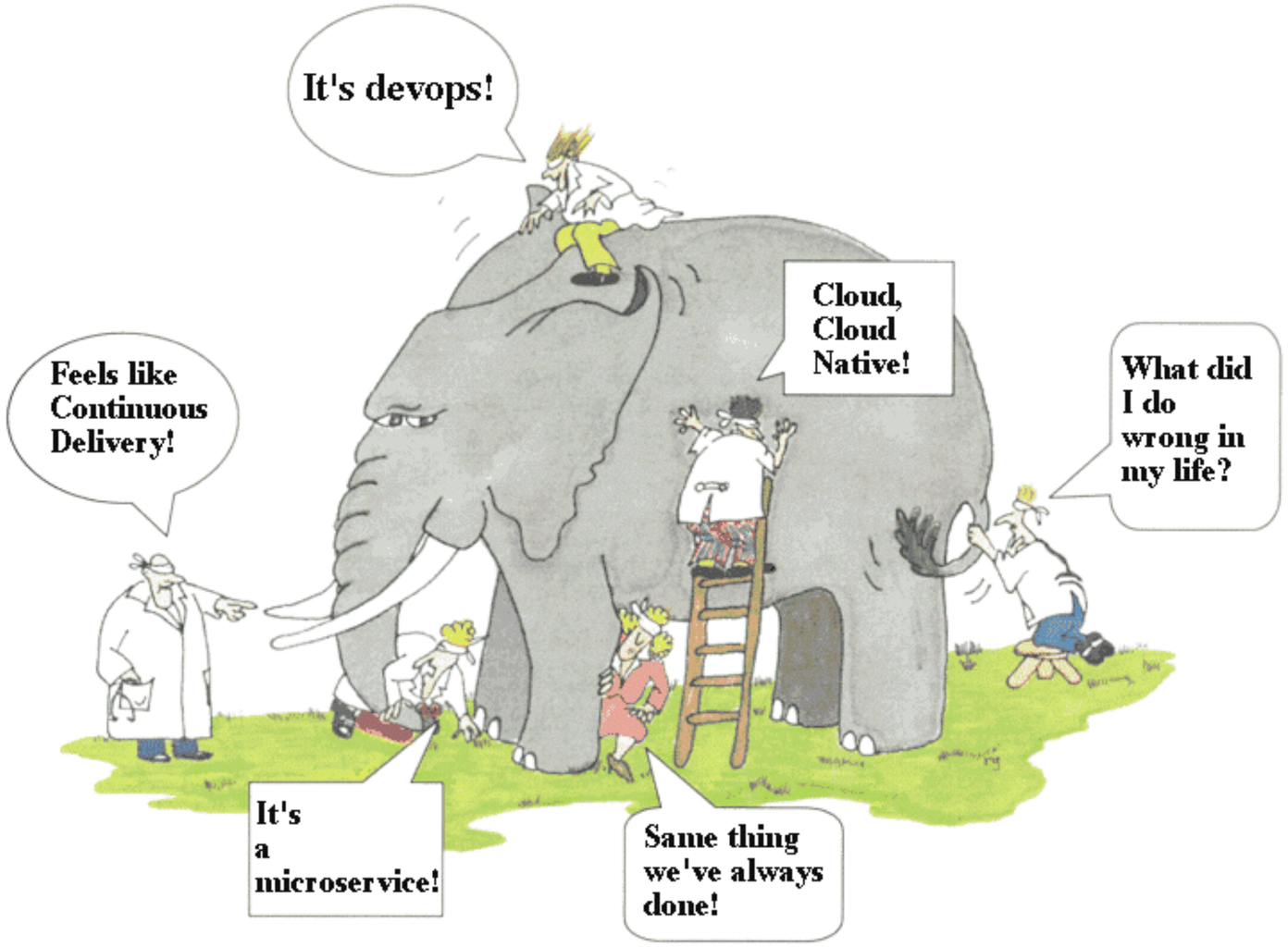
tl;dr

you are continuously devopsing microservices

or losing to someone who is

continuous delivery,
devops,
microservices…

These things are all one…



tl;dr

you are building a learning organization

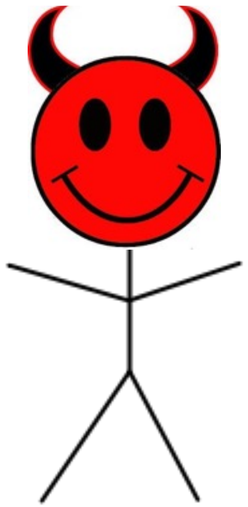
or losing to someone who is

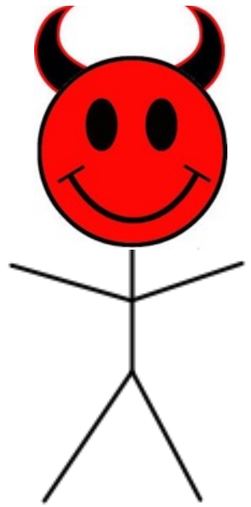
learning is sustainable advantage

operations is the secret sauce

just not ‘traditional operations’

Traditional IT



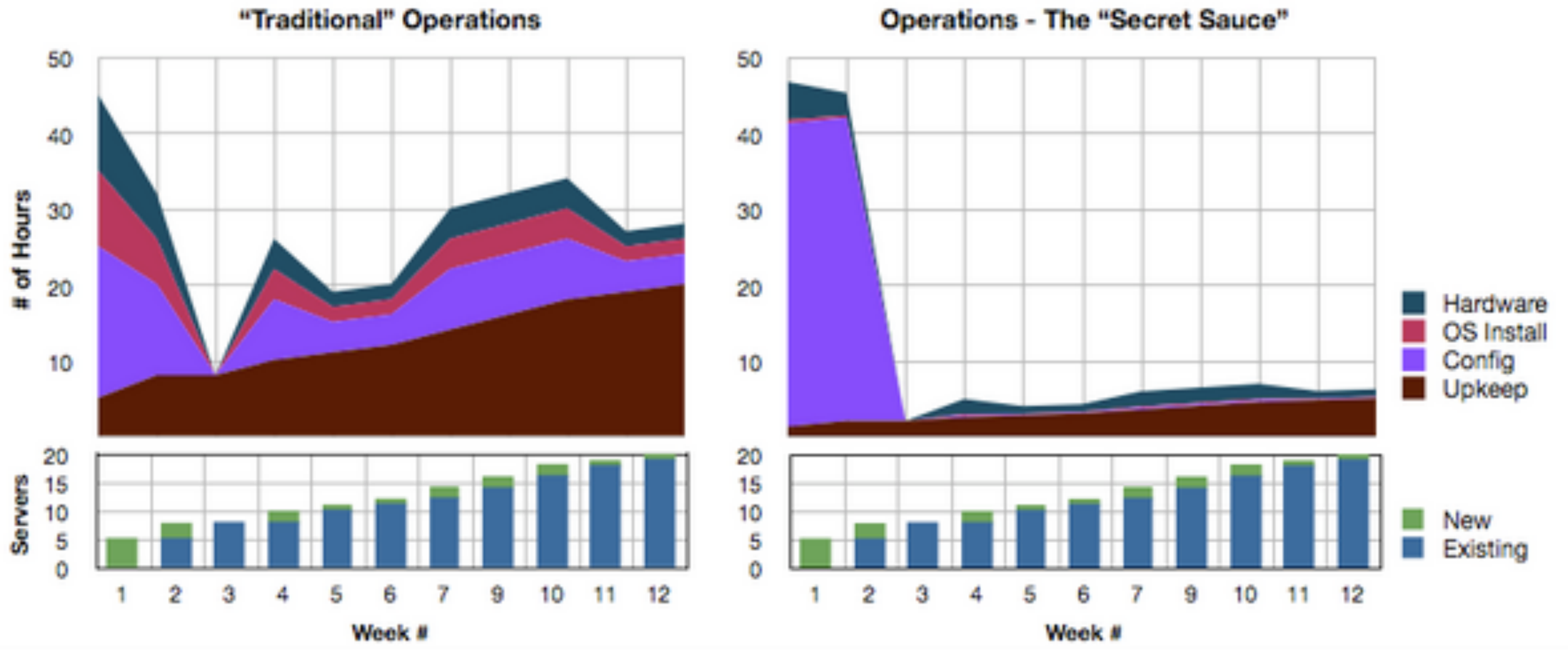


dev

ops

wall of confusion

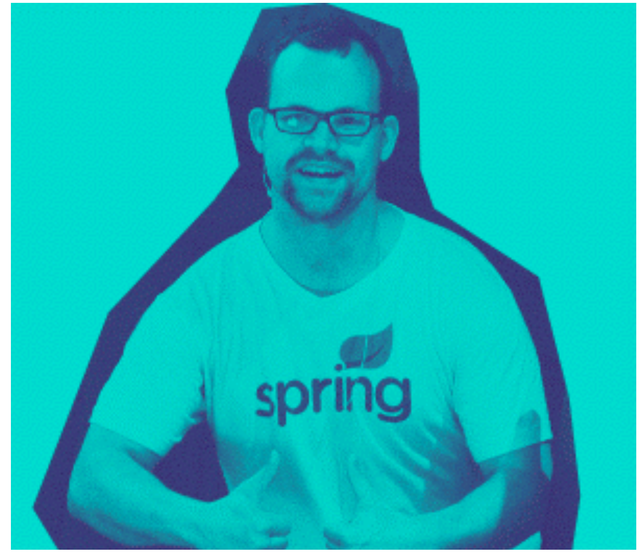
Opposing Forces



Operations is the secret sauce

“The traditional model is that you take your software to the wall that separates development and operations, and throw it over and then forget about it. Not at Amazon. You build it, you run it. This brings developers into contact with the day-to-day operation of their software. It also brings them into day-to-day contact with the customer. This customer feedback loop is essential for improving the quality of the service.”

–Werner Vogels, CTO Amazon



if you really love production…

you would carry a pager

Software's long-term cost

Software engineering as a discipline focuses on designing and building rather than operating and maintaining, despite estimates that 40%[1] to 90%[2] of the total costs are incurred after launch.

[1] Glass, R. (2002). Facts and Fallacies of Software Engineering, Addison-Wesley Professional; p. 115.
[2] Dehaghani, S. M. H., & Hajrahimi, N. (2013). Which Factors Affect Software Projects Maintenance Cost More? Acta Informatica Medica, 21(1), 63–66. http://doi.org/10.5455/AIM.2012.21.63-66

Google Cloud

devops

- developers and operations can and should work together
- system administration evolving to look more like software development
- evolving together as global community sharing solutions

me - in 2010

devops - calms

- culture
- automation
- lean
- metrics
- sharing

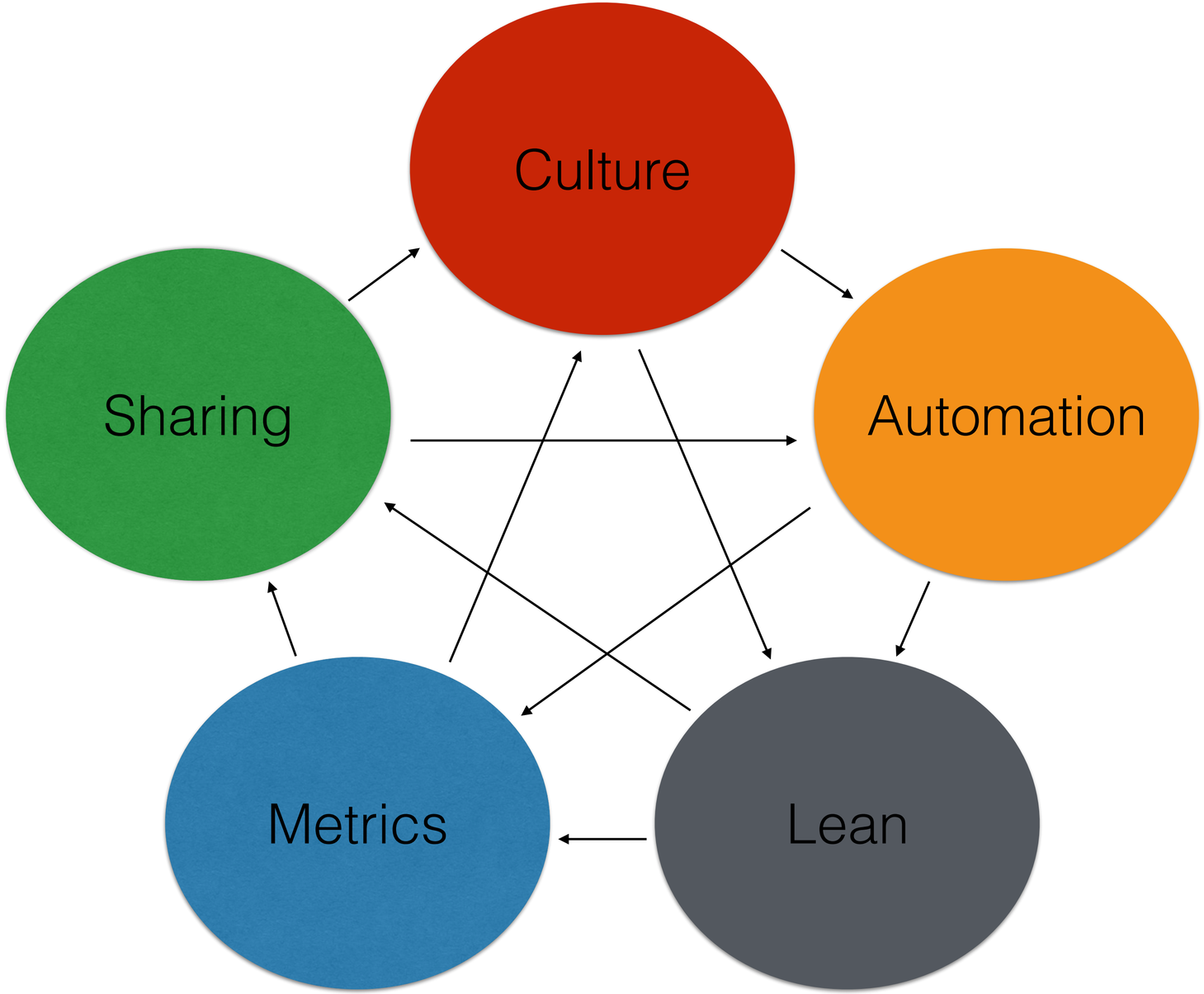
Damon Edwards and John Willis

this is the devops

wtf does that mean?

wtf am I supposed to do now?


火
木
土
水
金



I’m allegedly writing a book

Culture


‘Culture eats strategy for breakfast’
- Peter Drucker

Westrum Topology Culture

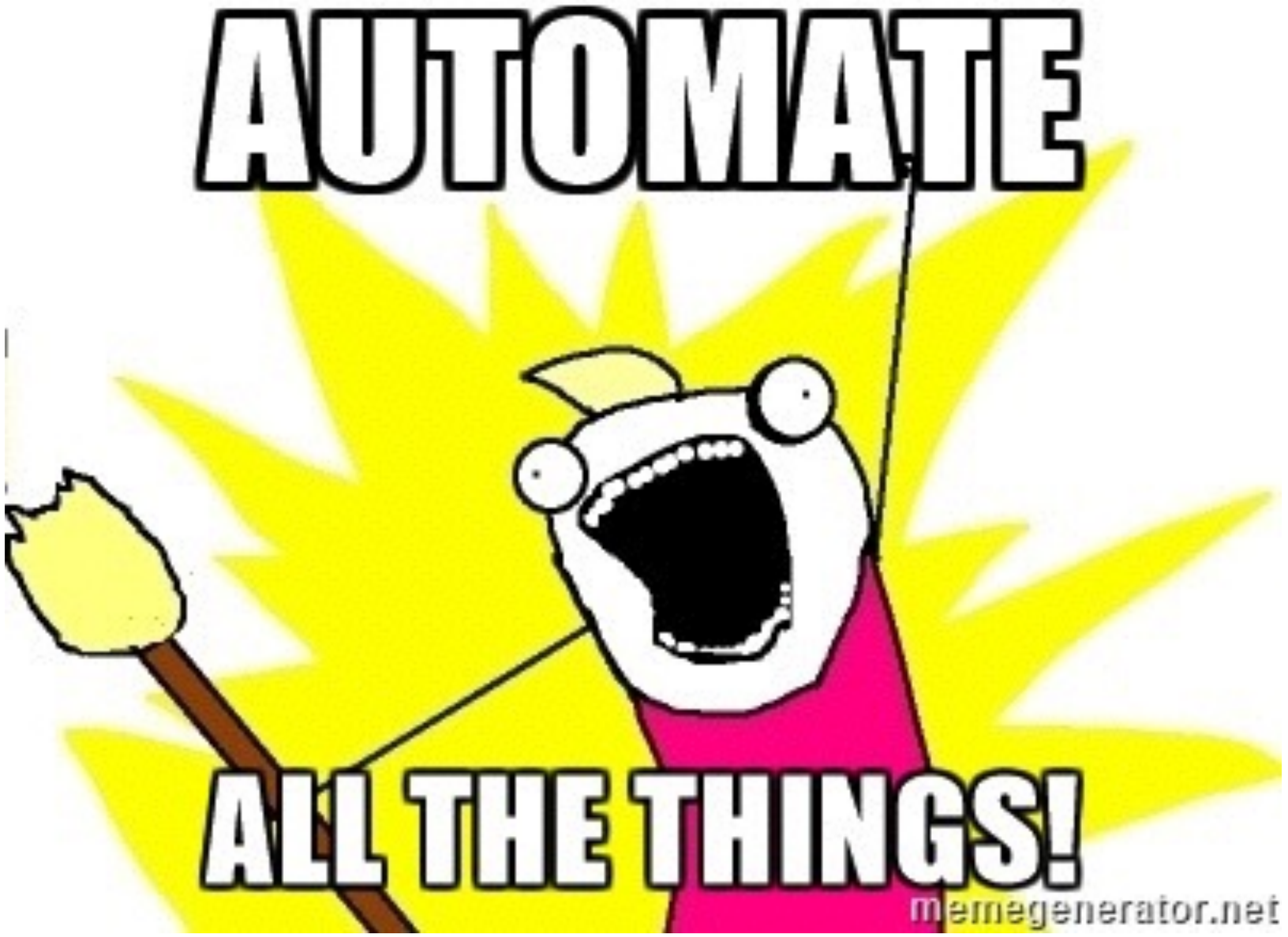
Pathological (power-oriented)	Bureaucratic (rule-oriented)	Generative (performance-oriented)
Low cooperation	Modest cooperation	High cooperation
Messengers shot	Messengers neglected	Messengers trained
Responsibilities shirked	Narrow responsibilities	Risks are shared
Bridging discouraged	Bridging tolerated	Bridging encouraged
Failure leads to scapegoating	Failure leads to justice	Failure leads to enquiry
Novelty crushed	Novelty leads to problems	Novelty implemented

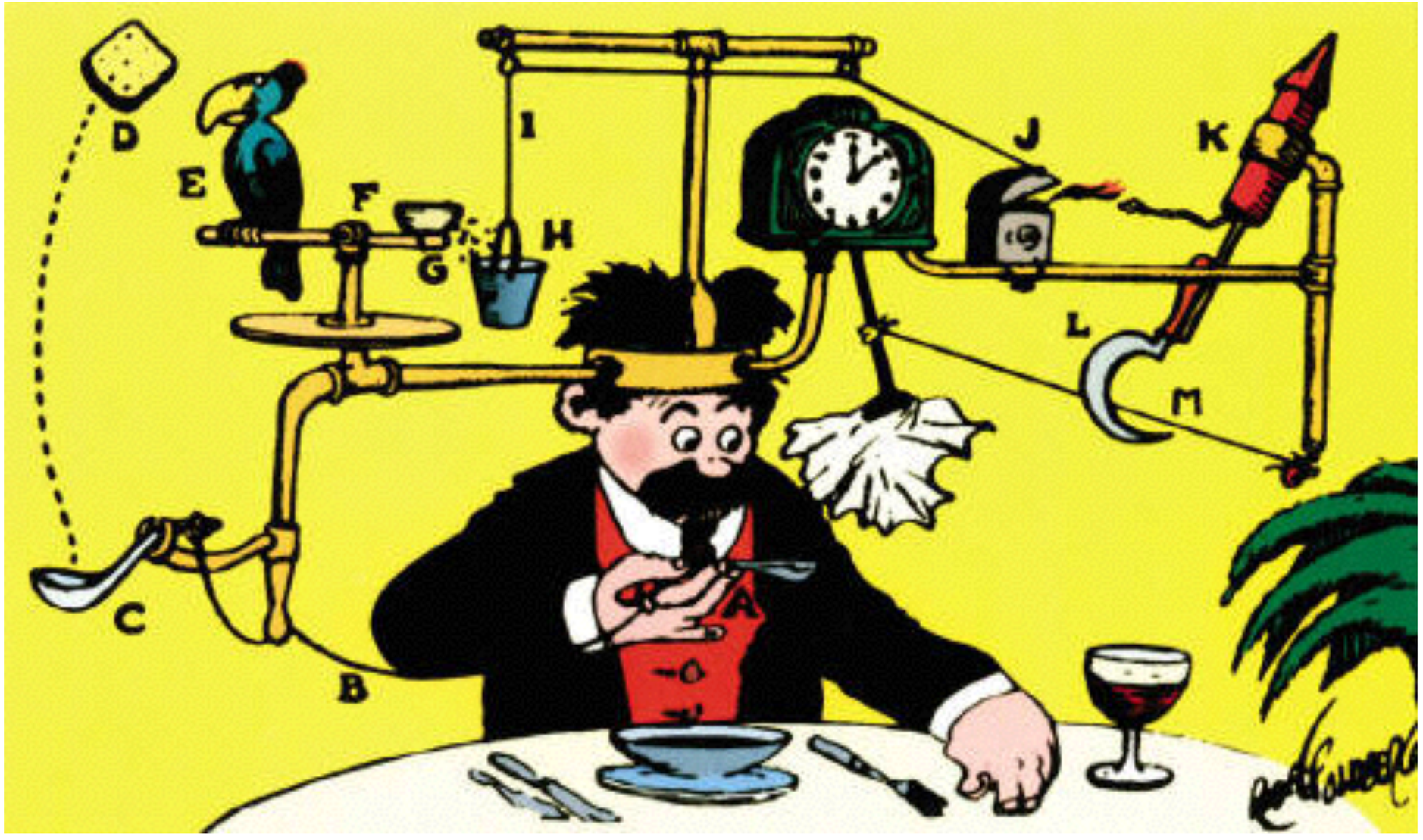
align incentives and interests

competitive advantage
vs
cost center

Automation

& Architecture


AUTOMATE
ALL THE THINGS!
memegenerator.net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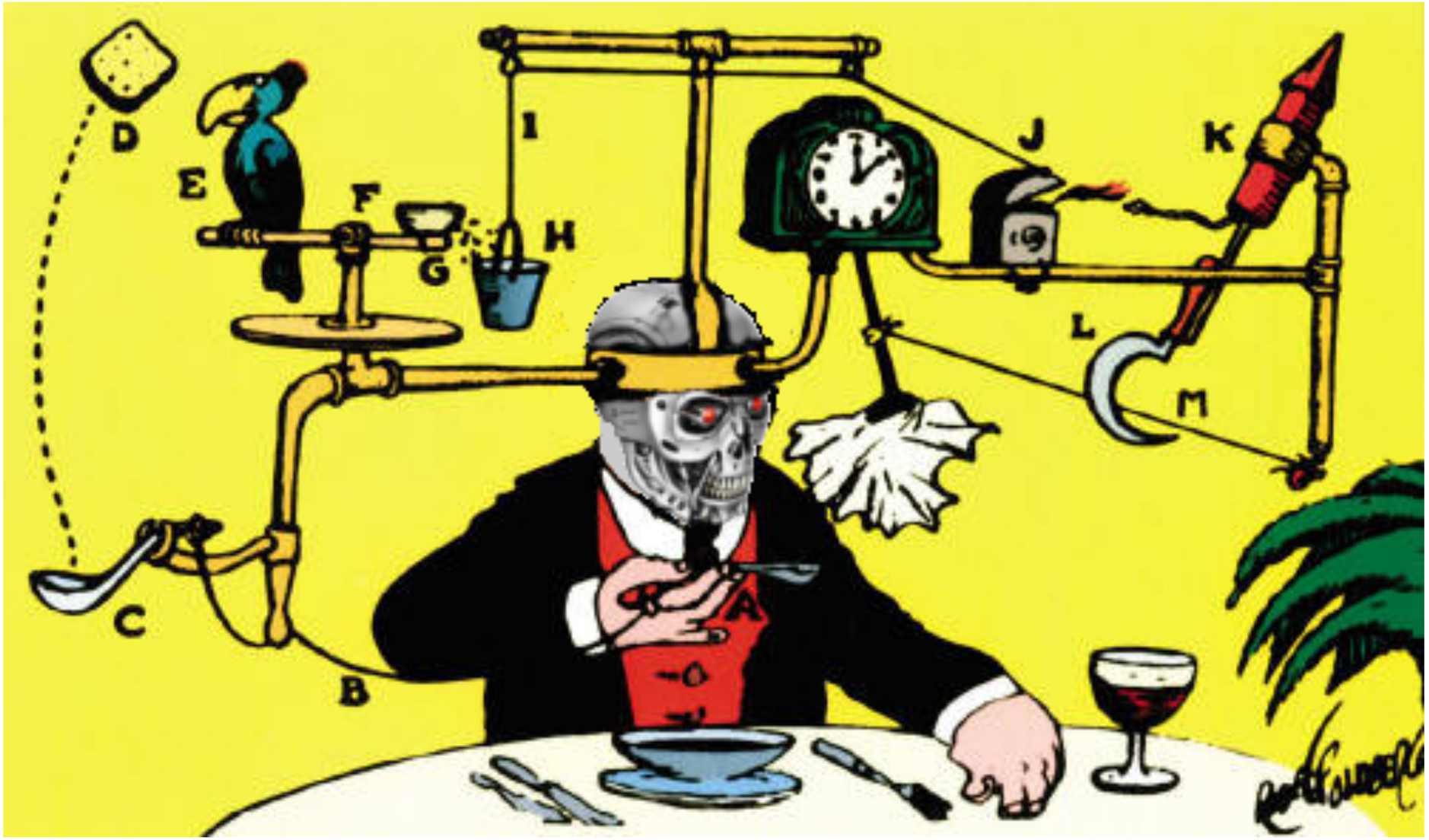
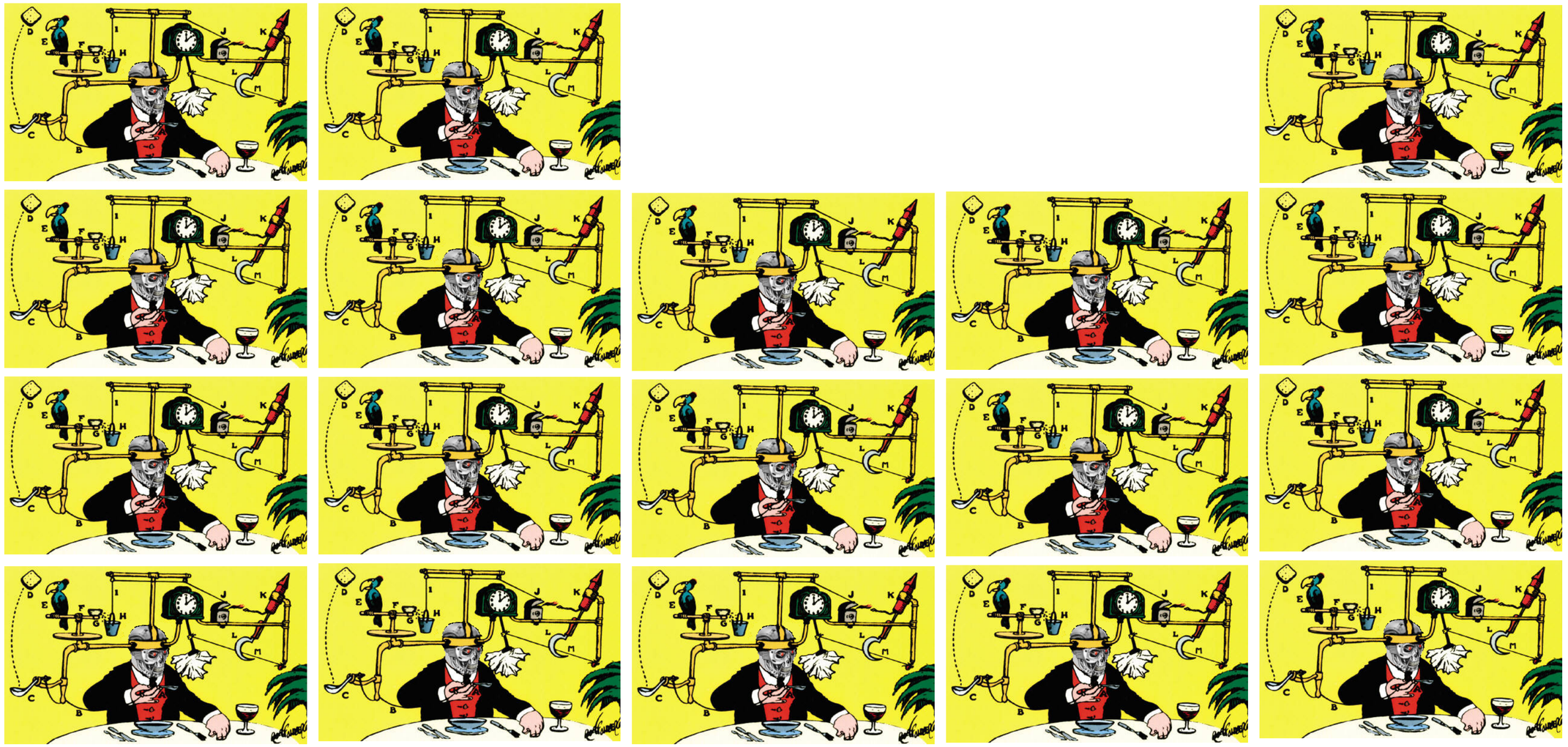


yay automation!

what, how and why you automate is as important that you do



yay automation!

If Tetris Has Taught Me Anything, It's That Errors Pile Up and Accomplishments Disappear

I’m sure some of you have lived this too

or are about to

Manual	Scripted	Platform
toil	effort	directed
catastrophic failure	disaster recovery	self healing
incidents	MTTR	continuous partial failure

Almost every task run under Borg contains a built-in HTTP server that publishes information about the health of the task and thousands of performance metrics

Metrics

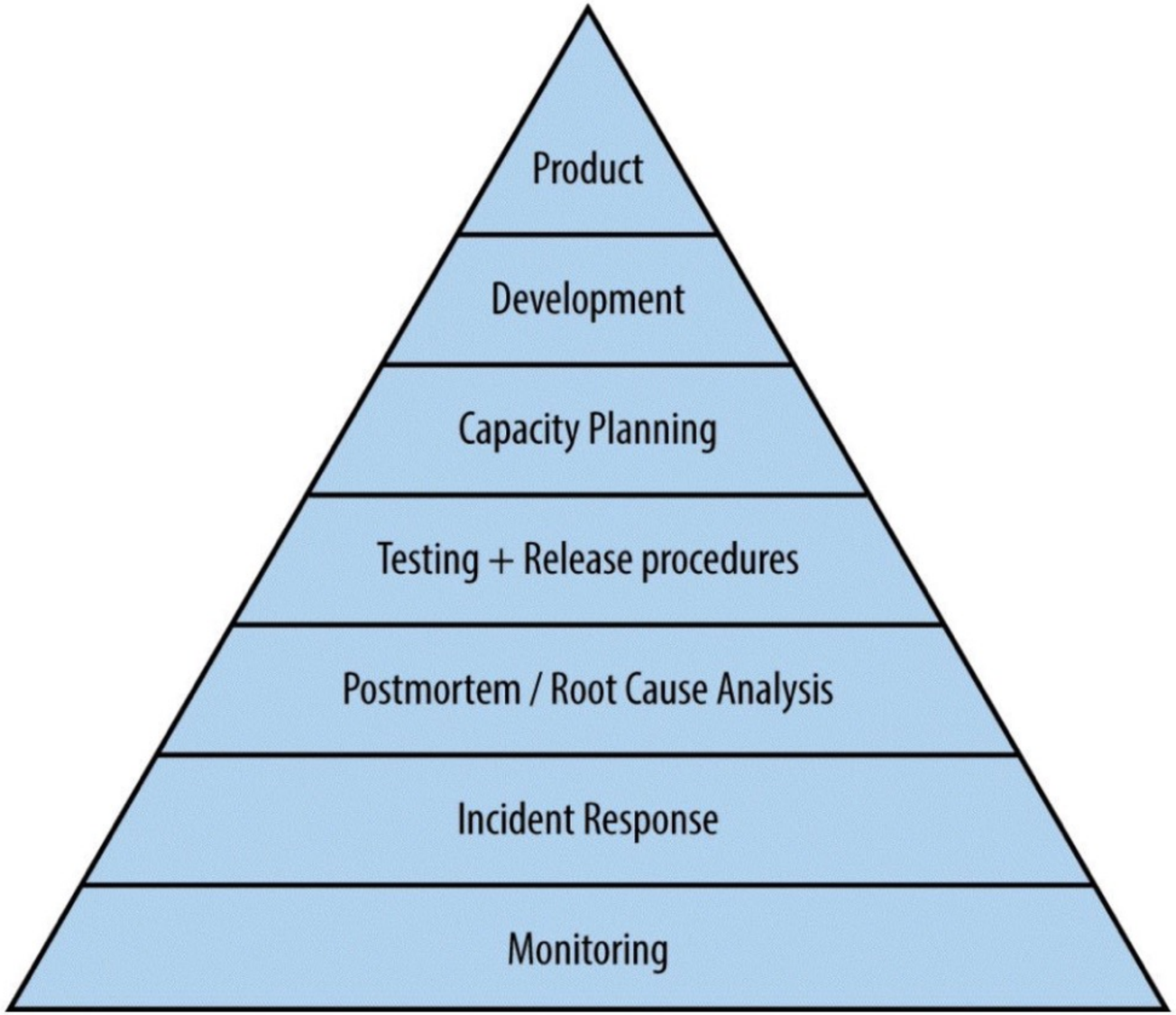


Figure III-1. Service Reliability Hierarchy

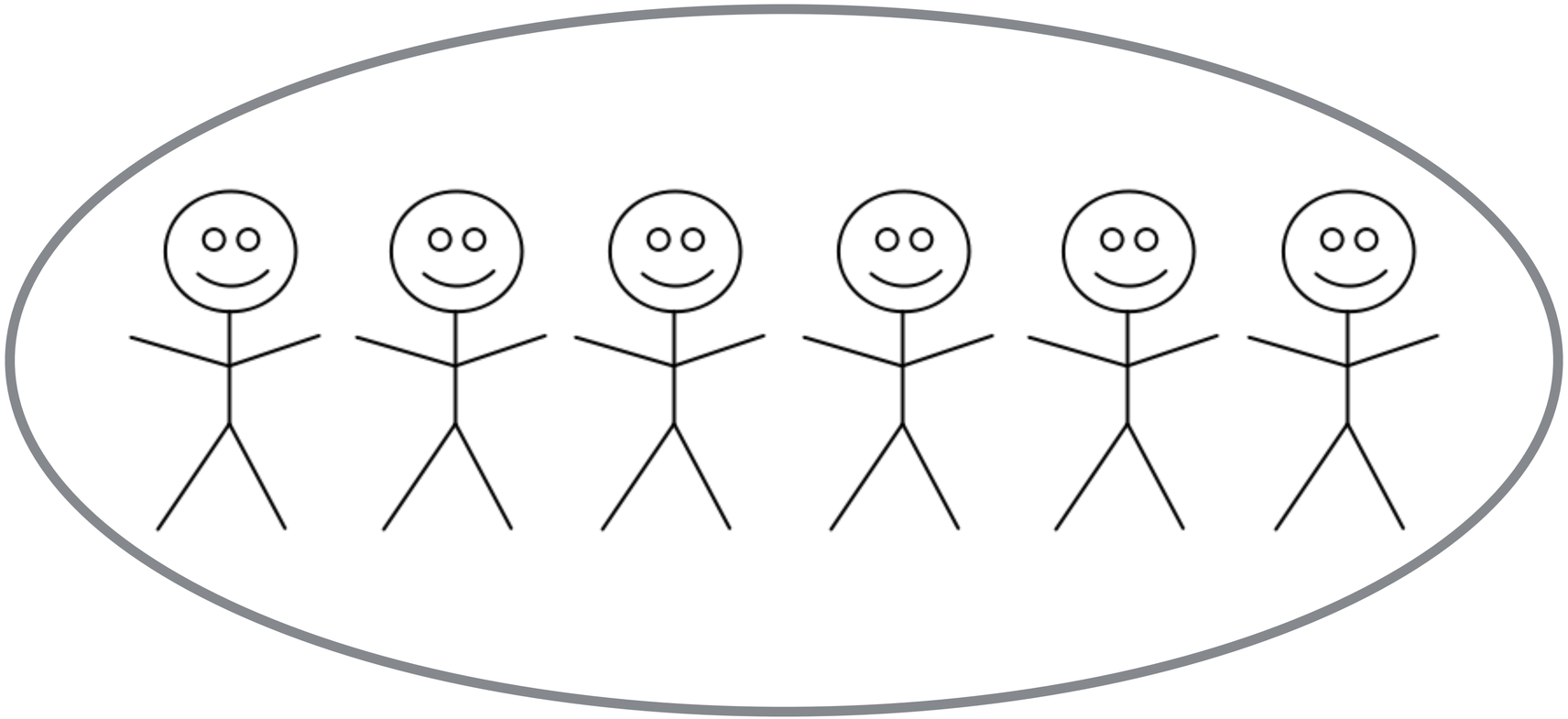
Service Level Objectives

what are your objectives?

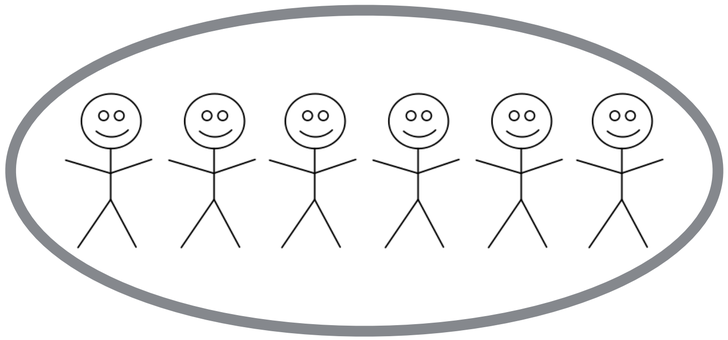
how do you know you are meeting them?

unmonitored	measured	insightful
no info	data	SLI
ssh	aggregation	dashboards
never gets done	secondary	built in

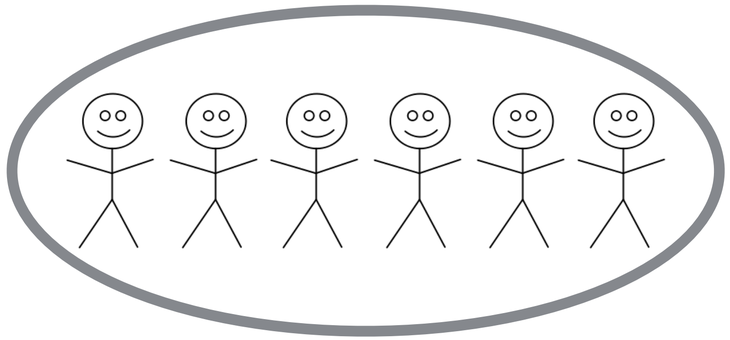
Sharing



Global Community of Practice

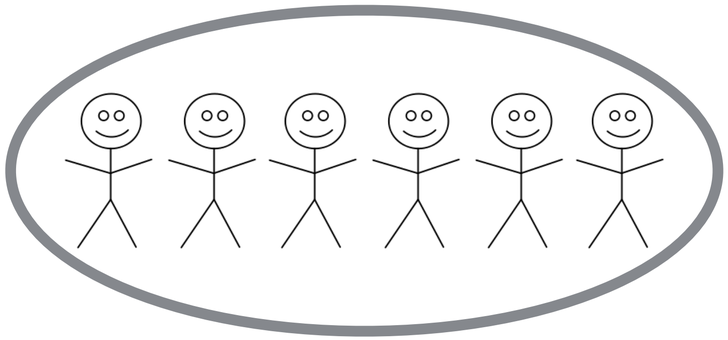


dev

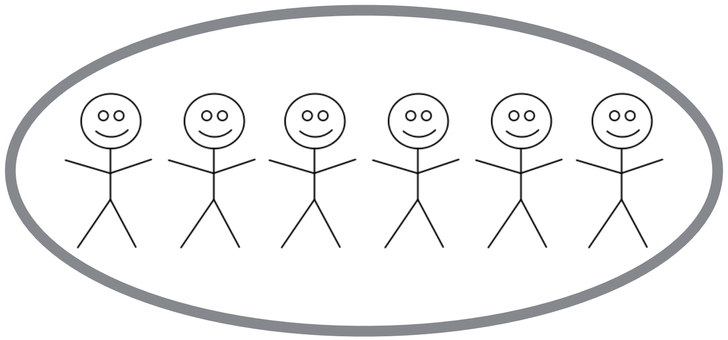


ops

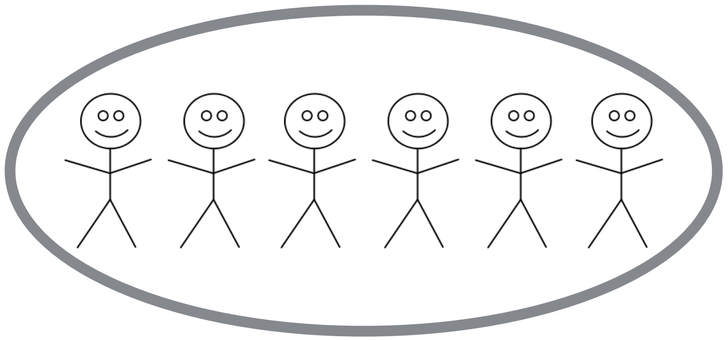
wall of confusion



dev

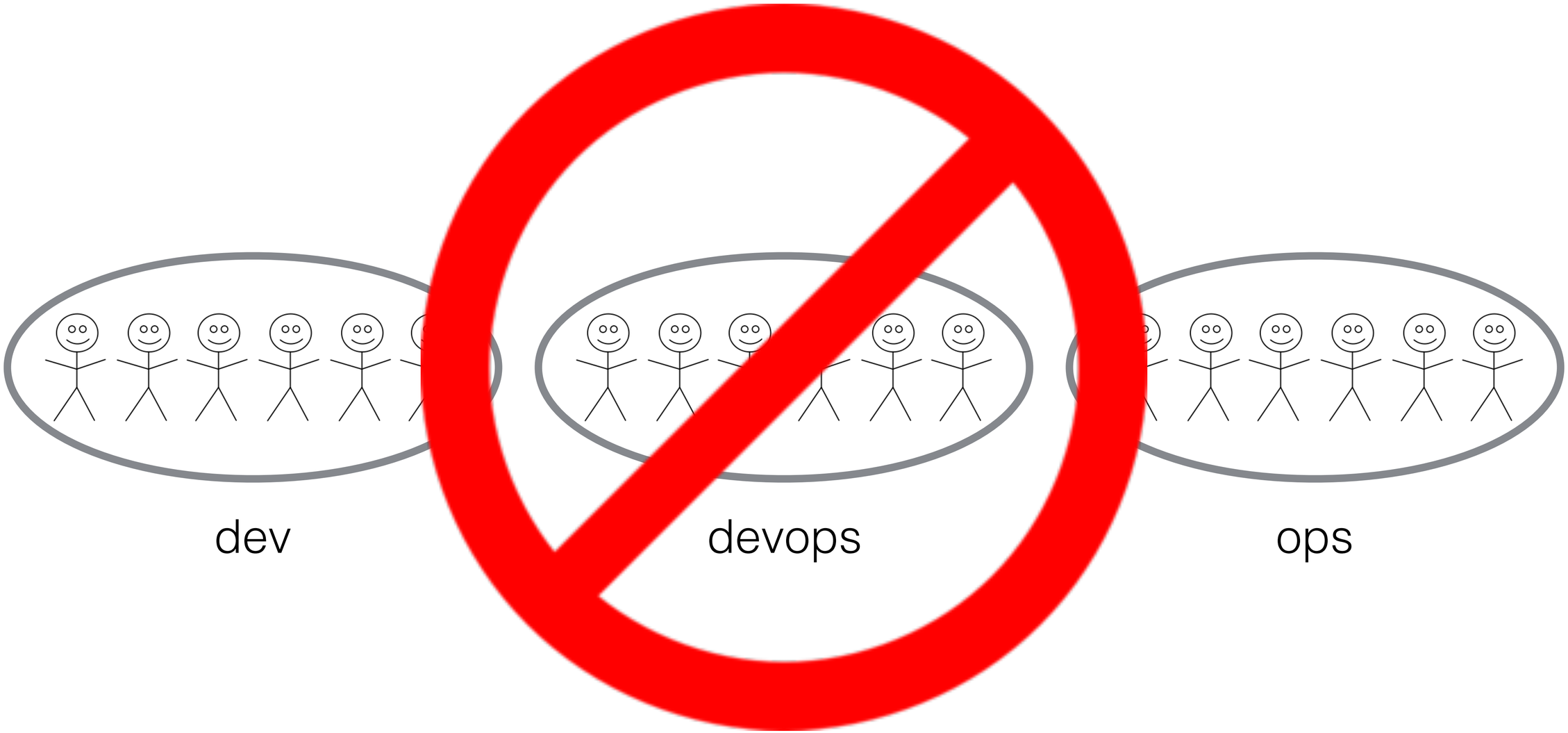


devops

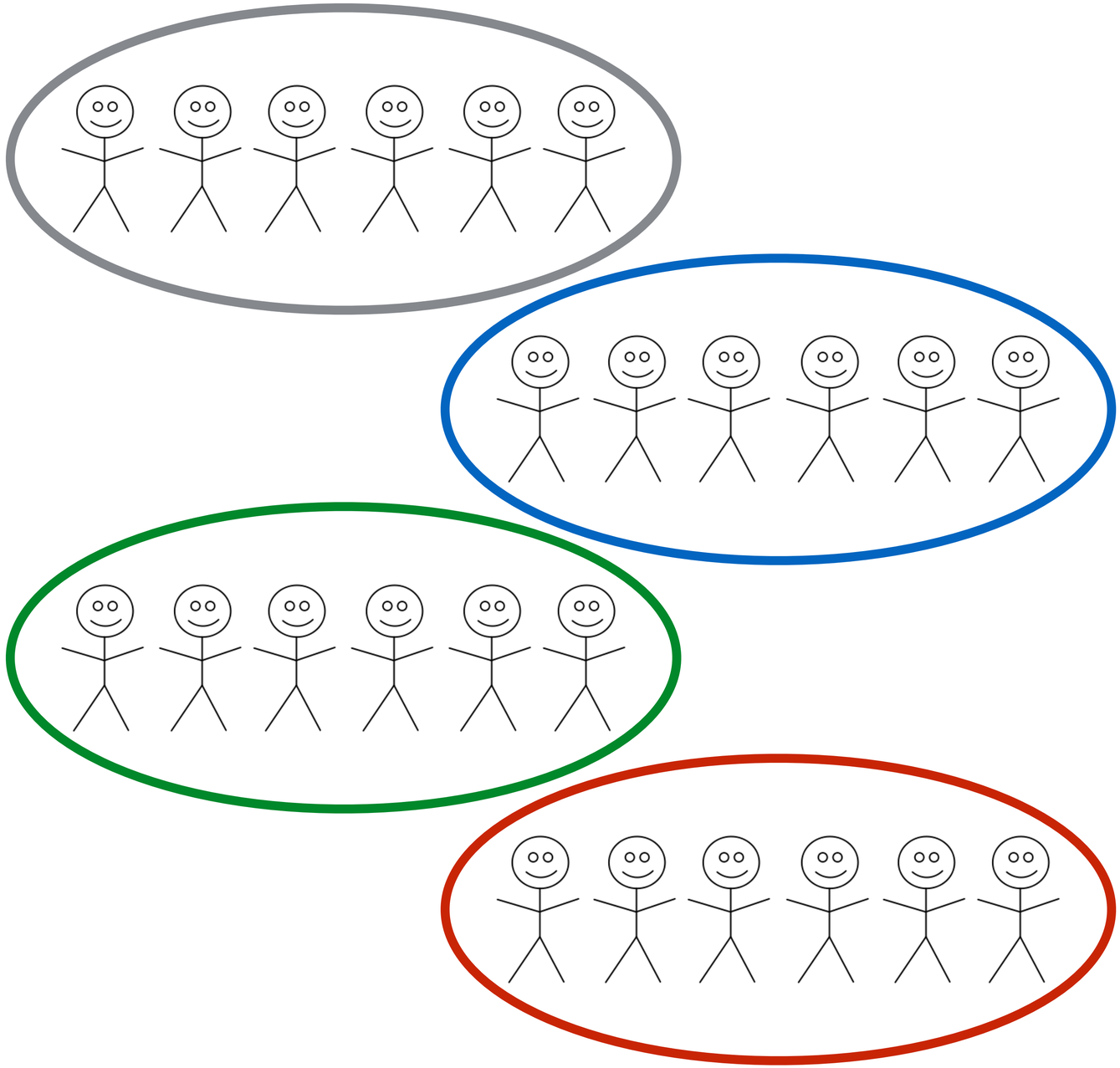


ops

YAY!!


dev
devops
ops


Don’t.
Just
don’t.

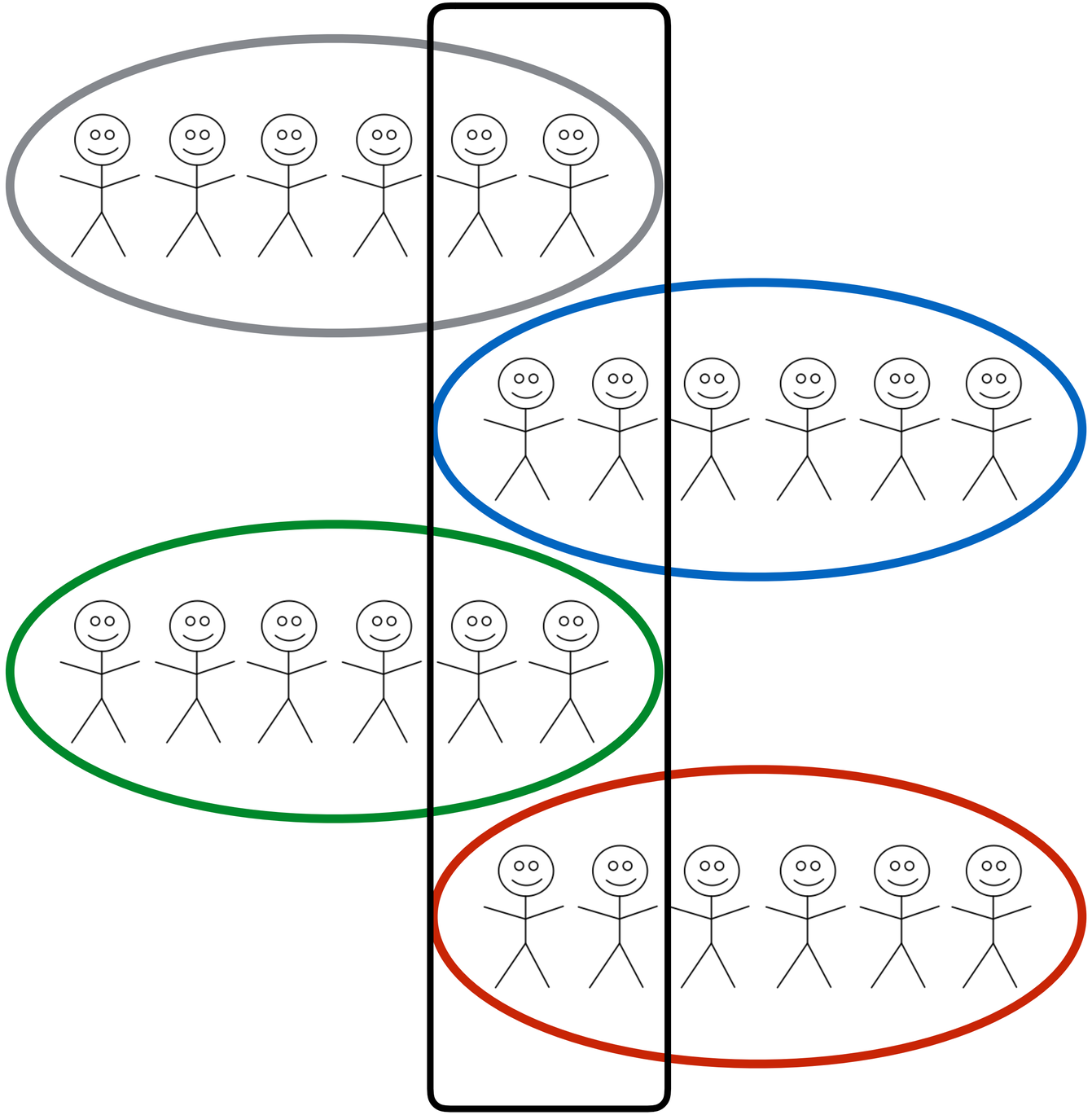


developers

operations

business

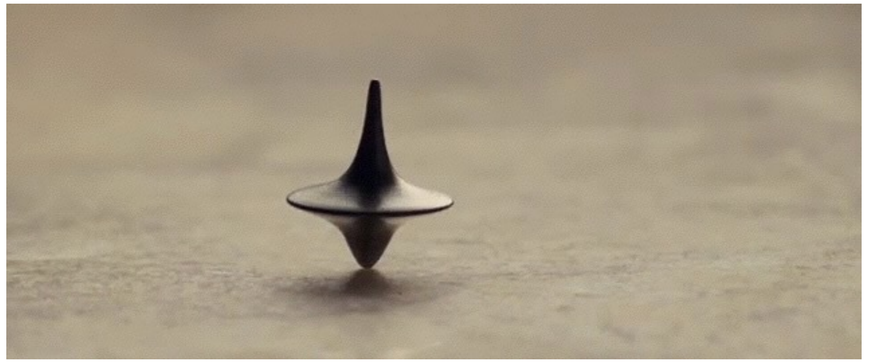
security



community of interest

hidden	available	ambient
can’t find	searchable	cultivated
strong silos	publish info	share personally
everything is secret	secret to company	global community

Lean



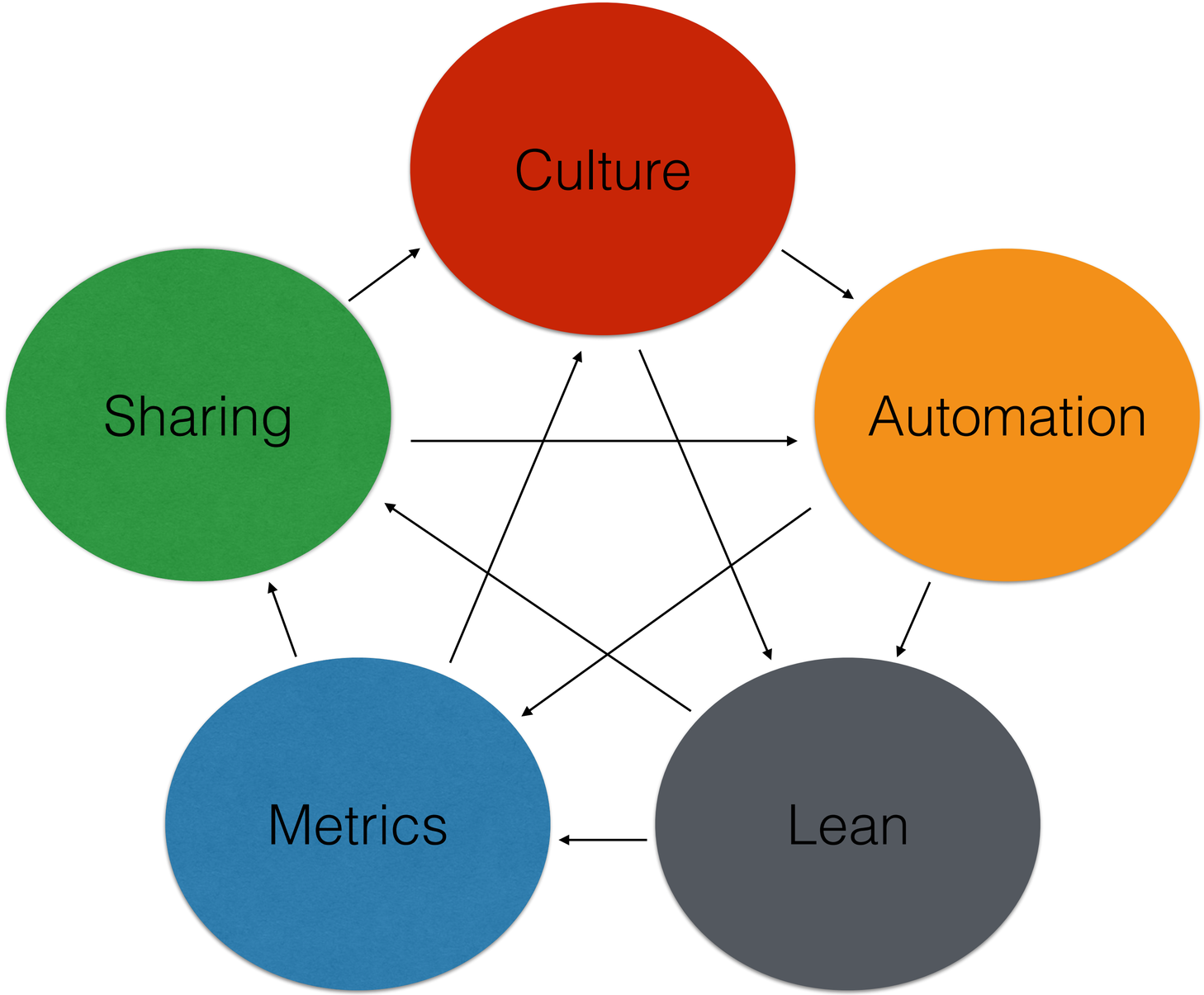
Lean Subsumes ALL the Things

Continuous Improvement

Kai = Change Zen = Good

CALMS sounds better than CAMS

¯_(ツ)_/¯


Culture
Sharing
Automation
Metrics
Lean

culture	automation	lean	metrics	sharing
pathological	manual	isolated	nothing	hidden
bureaucratic	discrete	systemic	measurement	available
generative	continuous	exceptional	insight	ambient

mixing the elements

- pathological cultures can be automated
- automation can be unmonitored
- metrics can be hidden
- generative cultures can toil
- good enough can stagnate

everyone wants the devops

Well actually…

what they really want

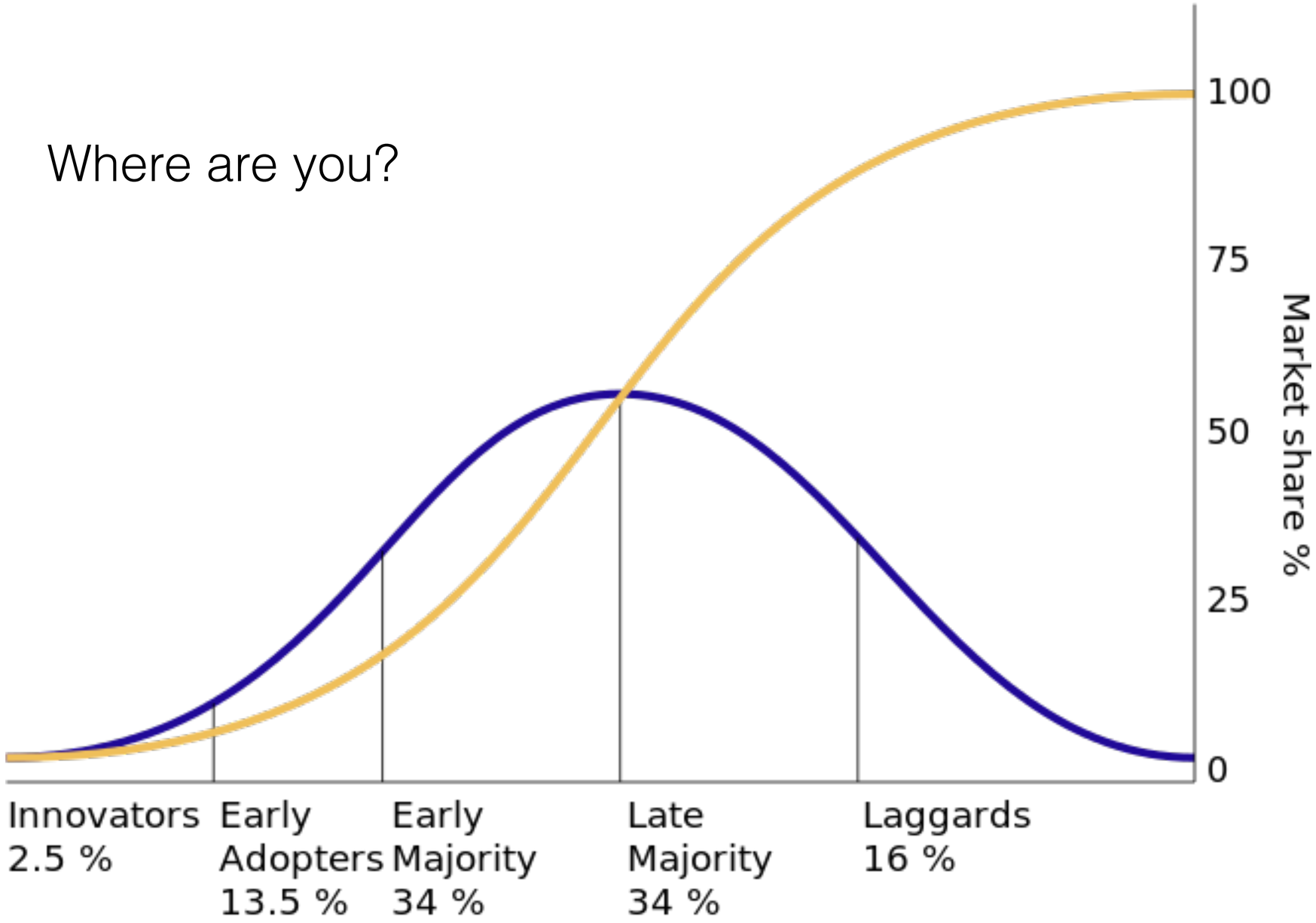
- scalability
- availability
- reliability
- operability
- usability
- observability
- all for free
- without changing anything

without changing anything

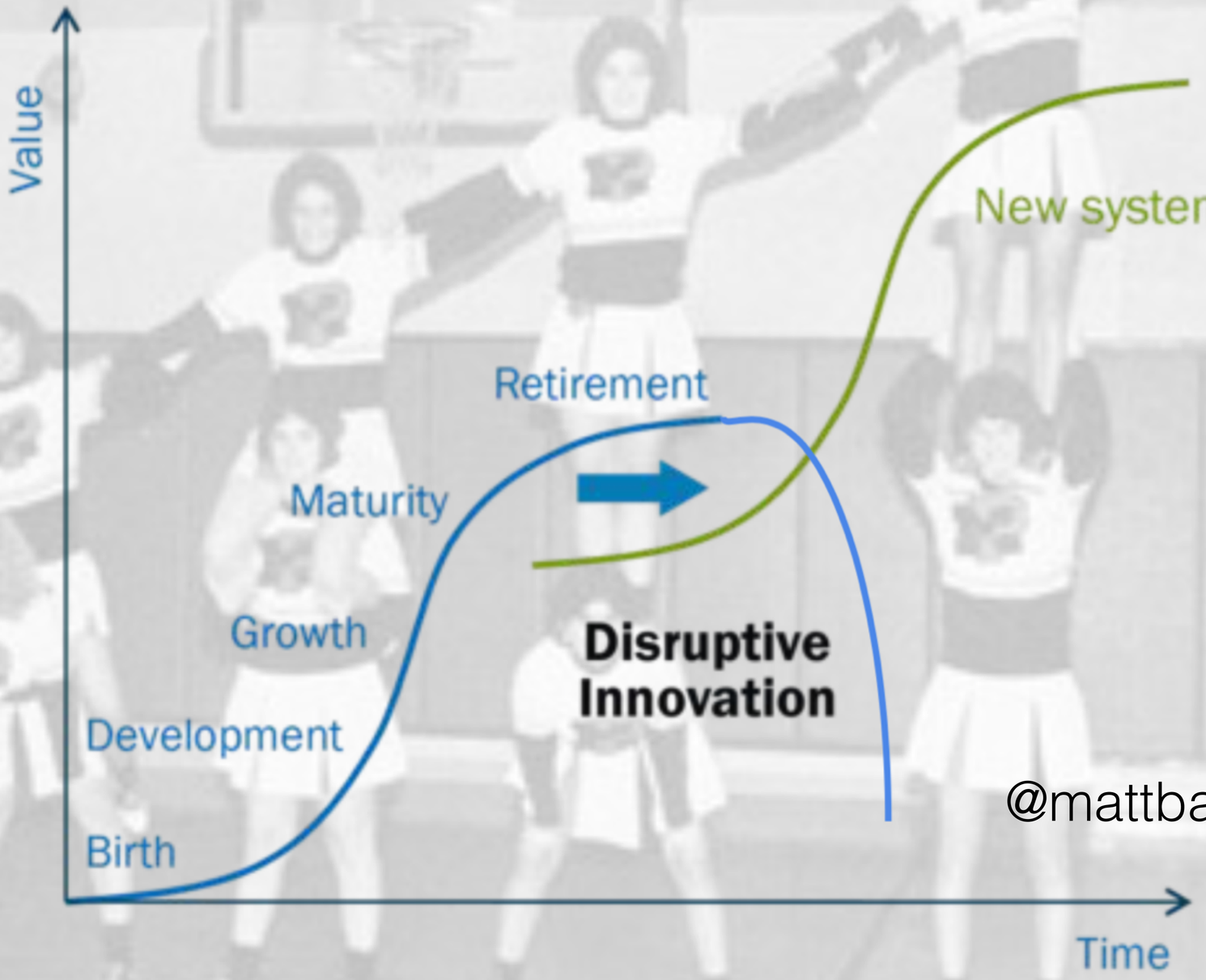
without changing anything

without
changing anything

Where are you?

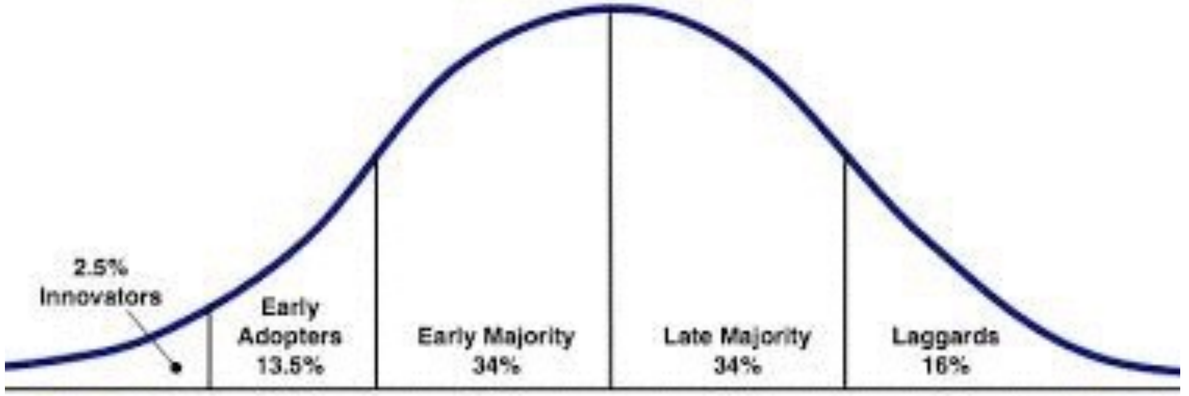


Innovations Build on Each Other



@mattbarcomb


2.5%
Innovators
Early
Adopters
13.5%
Early Majority
34%
Late Majority
34%
Laggards
16%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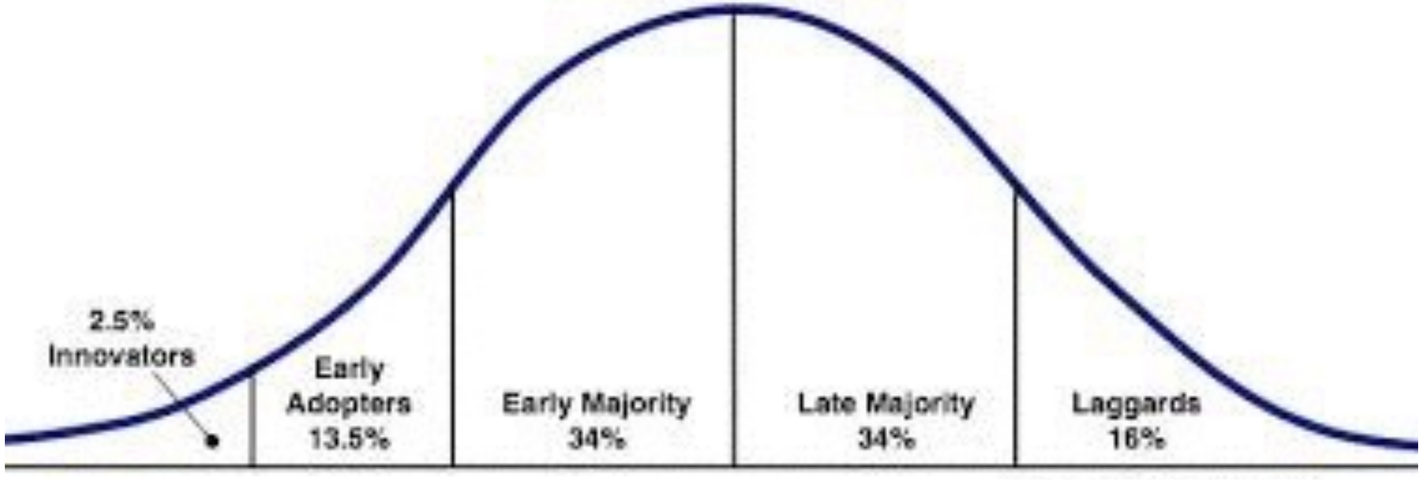
2.5%
Innovators
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Laggards
16%


富嶽三十六景 神奈川沖浪裏

WARNING:
surfing is hard

WARNING:
software is hard

software was always hard

often feels like this

Man Shouts “F*ck That Alligator”, Jumps Into Lake And Is Killed By Alligator

the 5 stages of devops

- Denial
- Anger
- Bargaining
- Depression
- Acceptance

optimizing human performance and experience operating software…

with software…

and humans

software is hard

humans is harder

Opposing Forces

humans

terrible

humans

awesome

you are probably a human

humans can learn

You haven’t learned anything until you change your behavior

“I don’t have time to learn new things because I’m too busy getting things done!”

- least productive person in the world

saying ‘devops’ doesn’t fix pathological culture

saying ‘devops’ doesn’t fill
a lack of vision

saying ‘devops’ doesn’t align incentives and interests

software is creative

software is complex

software is not digging ditches

software is not running factories

software is closer to art than science

Principles > Practices >Tools

mindset > skillset > toolset

adapt > adopt

why > what

smart motivated people working together

‘the best methodology’

Call to Action

- be smart
- be motivated
- work together
- change your behavior
- change your behavior
- change your behavior

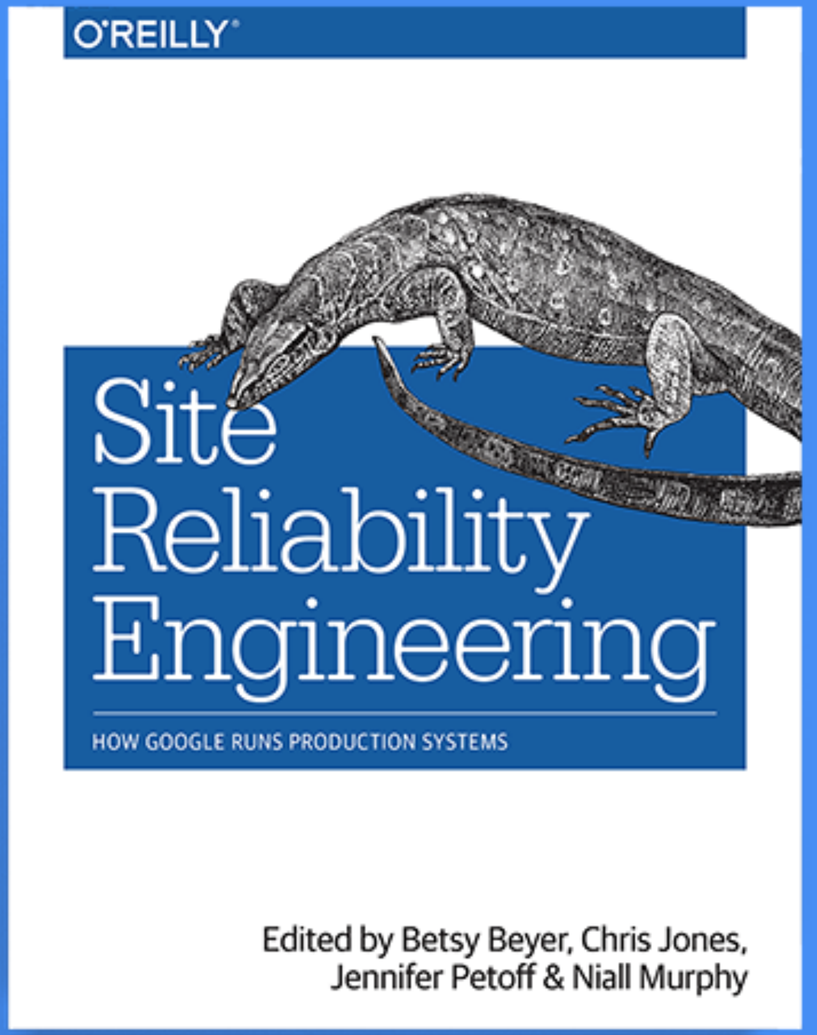

火
木
土
水
金

BONUS

Homework

- Embracing Risk
- Service Level Objectives
- Eliminating Toil

Bonus: Communication and Collaboration in SRE



Site Reliability Engineering

Edited by Betsy Beyer, Chris Jones, Jennifer Petoff and Niall Richard Murphy

Members of the SRE team explain how their engagement with the entire software lifecycle has enabled Google to build, deploy, monitor, and maintain some of the largest software systems in the world.

READ ONLINE FOR FREE

BUY FROM GOOGLE BOOKS

https://landing.google.com/sre/book.html

Google’s devops implementation

SRE - calms

- ✓ culture
- ✓ automation
- ✓ lean
- ✓ metrics
- ✓ sharing

謝謝

I’m not here to answer questions.

I’m here to have conversations.

@littleidea

We are uncovering better ways of developing software,

by doing it and helping others do it