

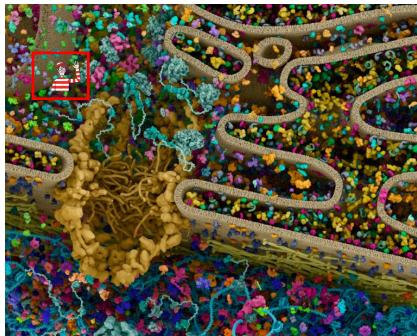
# Day 2 Observability

Building Organizational Understanding

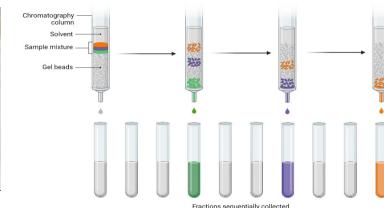
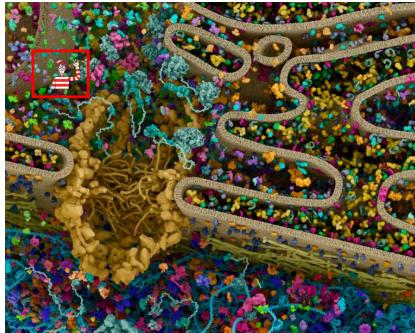


SCAN ME

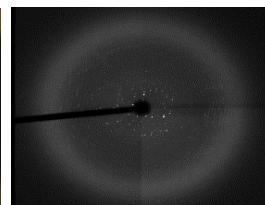
## Inside a cell



# Inside a cell

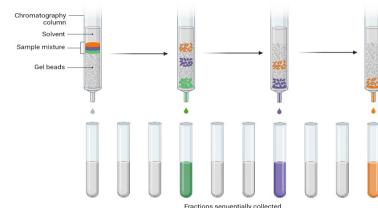
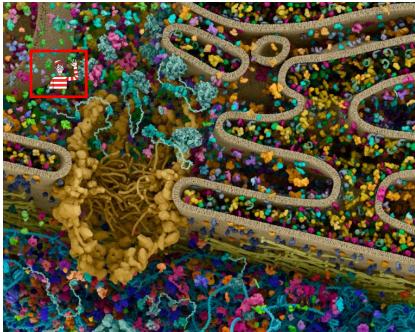


Protein crystals

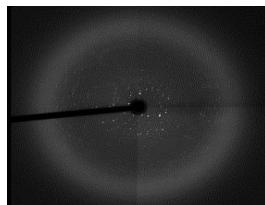


XRay diffraction

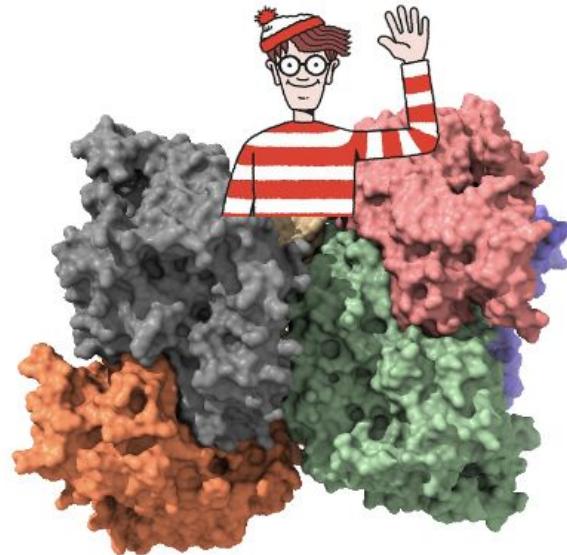
# Inside a cell



Protein crystals

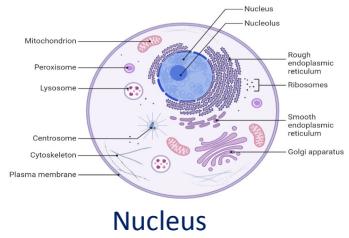


XRay diffraction

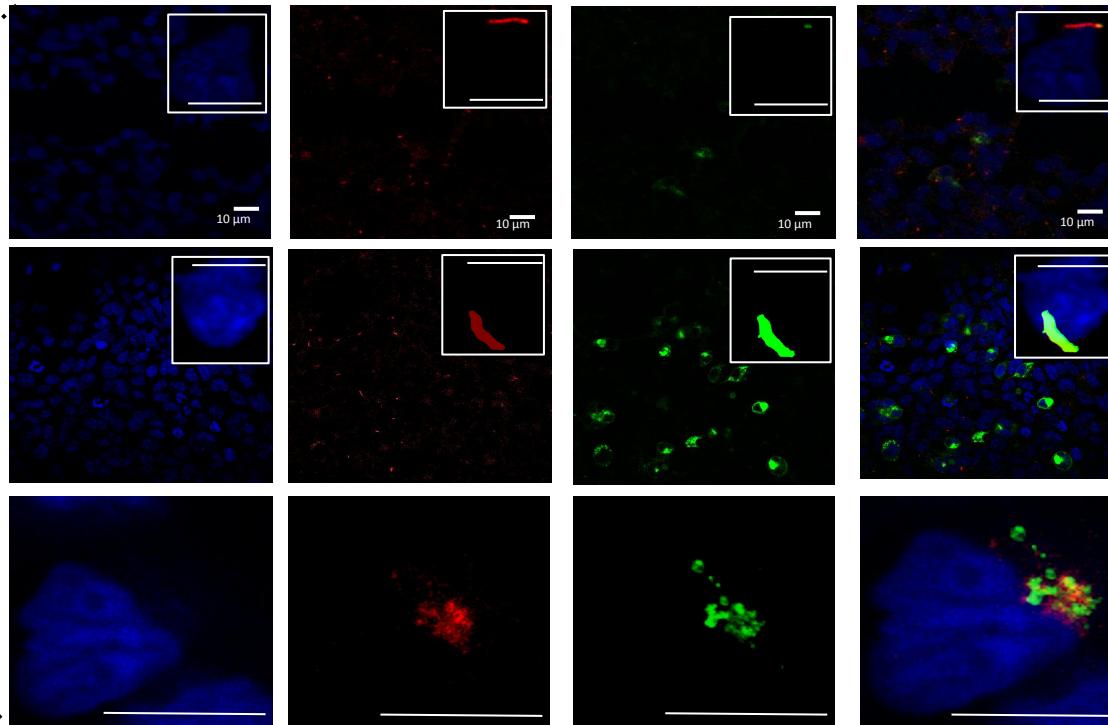


2.5 Å

2-7 years



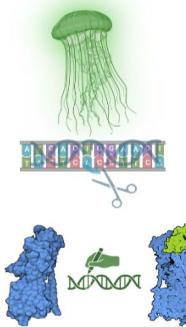
Fluorescent laser  
microscopy  
Live cell imaging



Cell signalling



Prim. Cilium



Channels  
MERGED



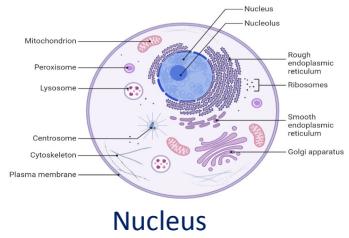
Control



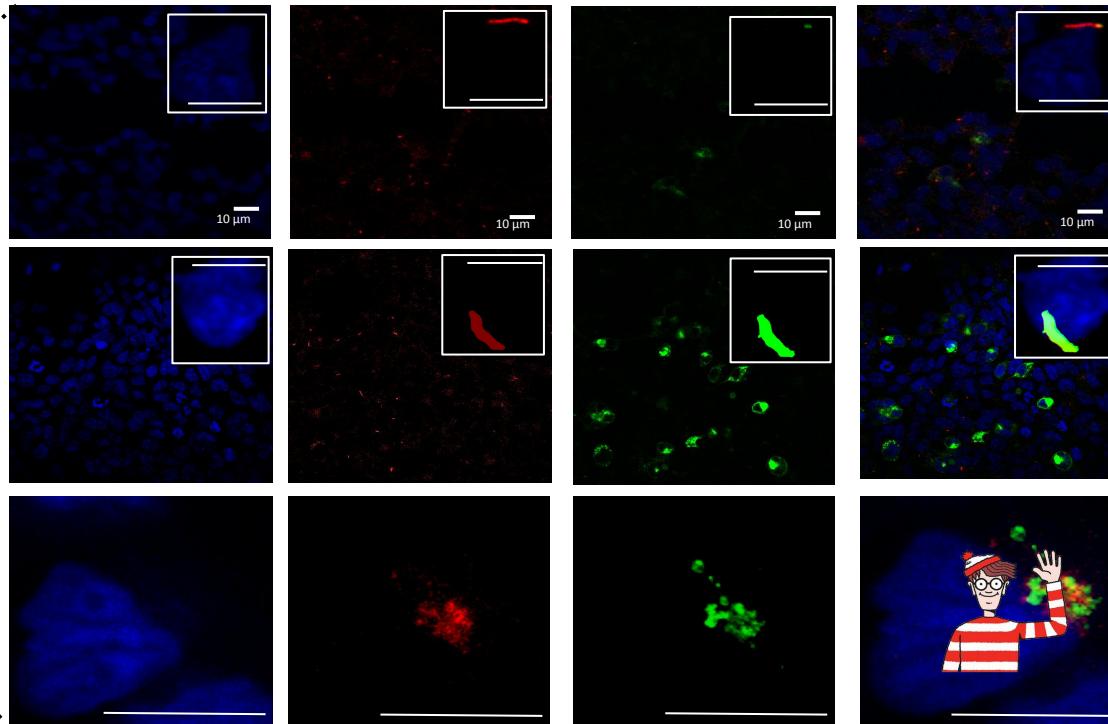
Stimulus



CRISPR/CAS9 Genetic  
Reprogramming



Fluorescent laser  
microscopy  
Live cell imaging

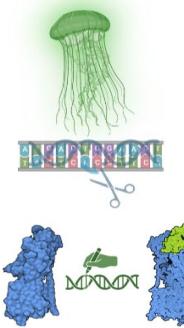


Cell signalling



Nucleus

Prim. Cilium



Channels  
MERGED



Control



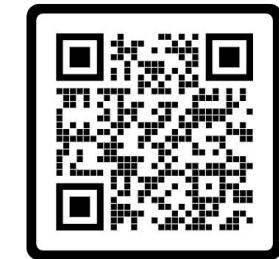
Stimulus



CRISPR/CAS9 Genetic  
Reprogramming

# Apostolis (Toli) Apostolidis

Principal Engineer @ Flipdish



SCAN ME

½ 🇬🇷 ½ 🇬🇧



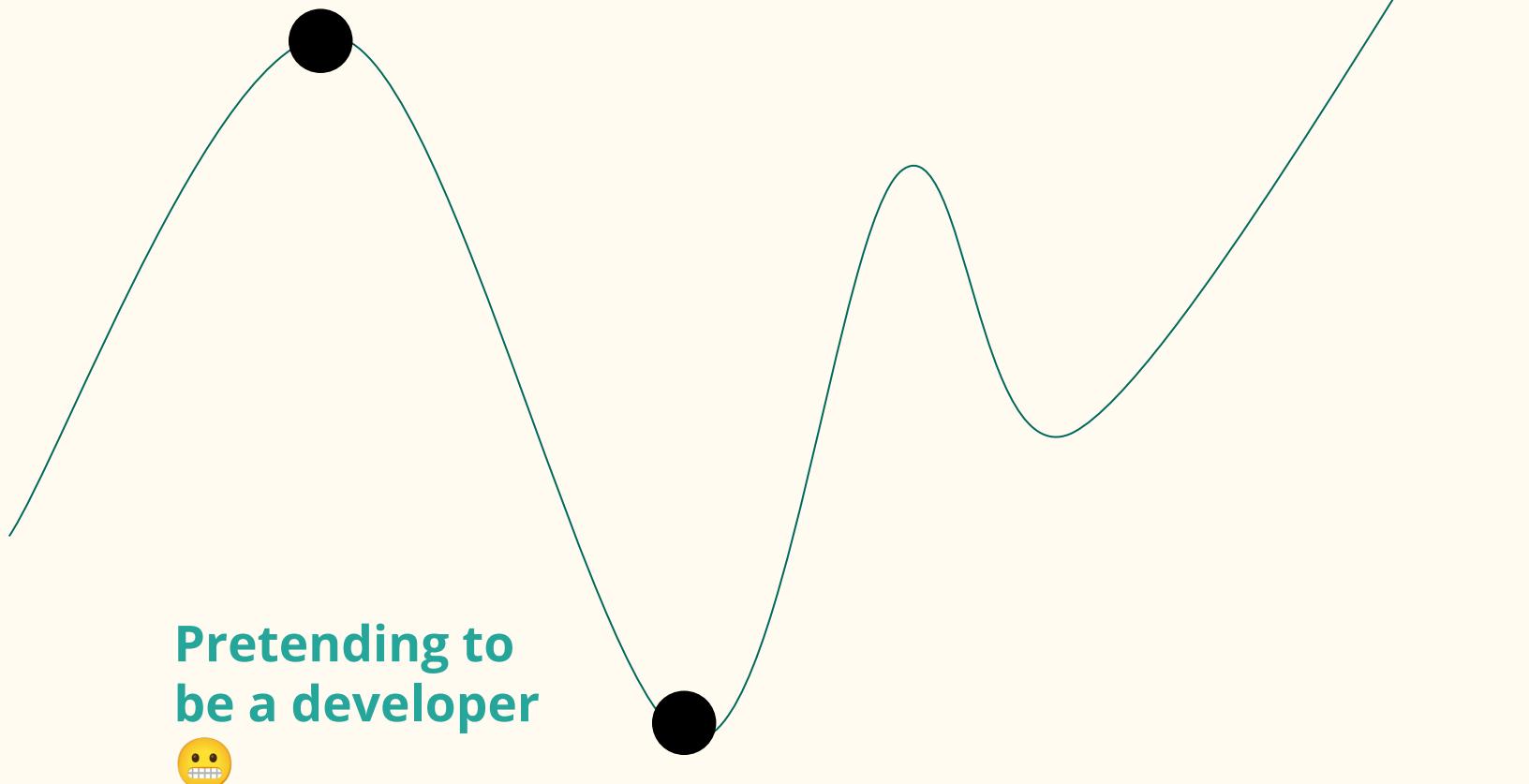


Don't care how the  
world works 😎





Don't care how the  
world works 😎





Don't care how the  
world works 😎



I've got this.  
It's easy 💪



Pretending to be  
a developer 😷





Don't care how the  
world works 😎



I've got this.  
It's easy 💪



Pretending to be  
a developer 😷



Oops,  
production  
breaks 😰





Don't care how the world works 😎



I've got this.  
It's easy 💪



Pretending to be a developer 😷



**Observability**



Oops,  
production  
breaks 😰



# Why am I here?

The more **observable** our systems,  
the more democratised our  
**understanding\***

The more **observable** our systems,  
the more democratised our  
**understanding\***

**\*of our software systems is across the org**

This talk is about  
observability.

If you can understand any novel state  
**without needing to ship new code,**  
you have **observability**.

*Charity Majors, Liz Fong-Jones, George Miranda.*  
*Observability Engineering*



It's a **property** of the system



It's a **property** of the system



**Explain** any bizarre or novel state



It's a **property** of the system



**Explain** any bizarre or novel state



Without shipping **new code**



It's a **property** of the system



**Explain** any bizarre or novel state

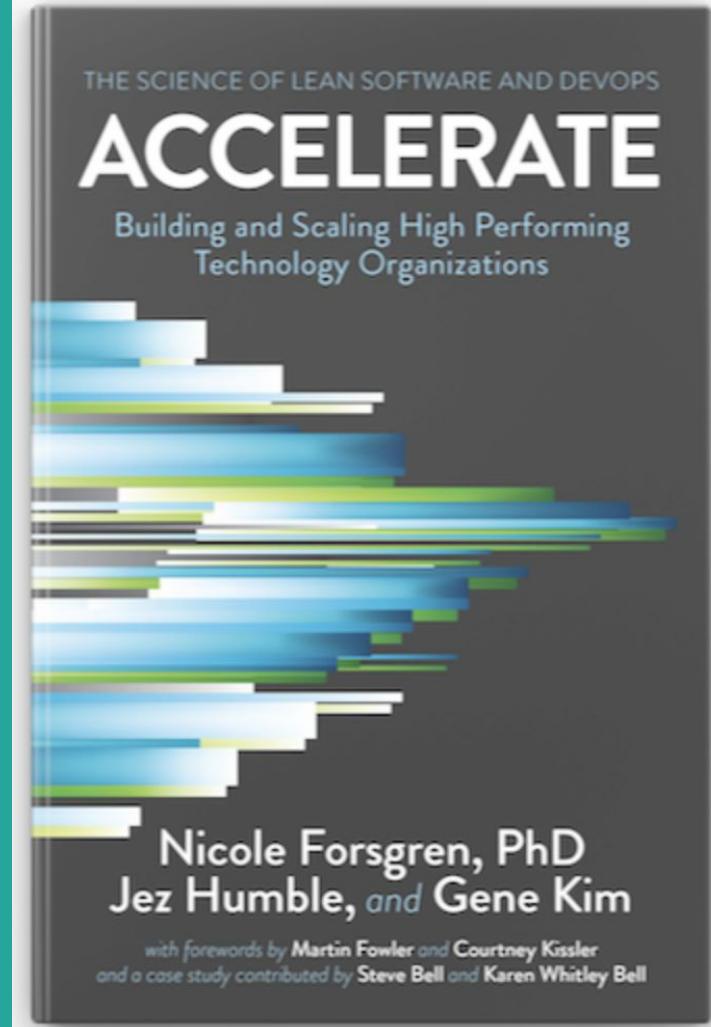


Without shipping **new code**

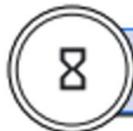


Without **predicting** any state

It's **not** another fad.



## SOFTWARE DELIVERY PERFORMANCE



lead time for changes



time to restore service



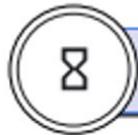
deployment frequency



change failure rate

Delivery **predicts** company success

## SOFTWARE DELIVERY PERFORMANCE



lead time for changes



time to restore service



deployment frequency



change failure rate

## OPERATIONAL PERFORMANCE

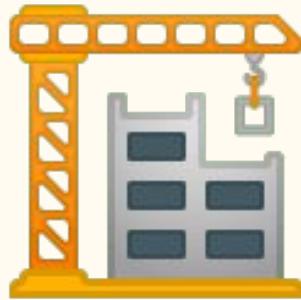


reliability

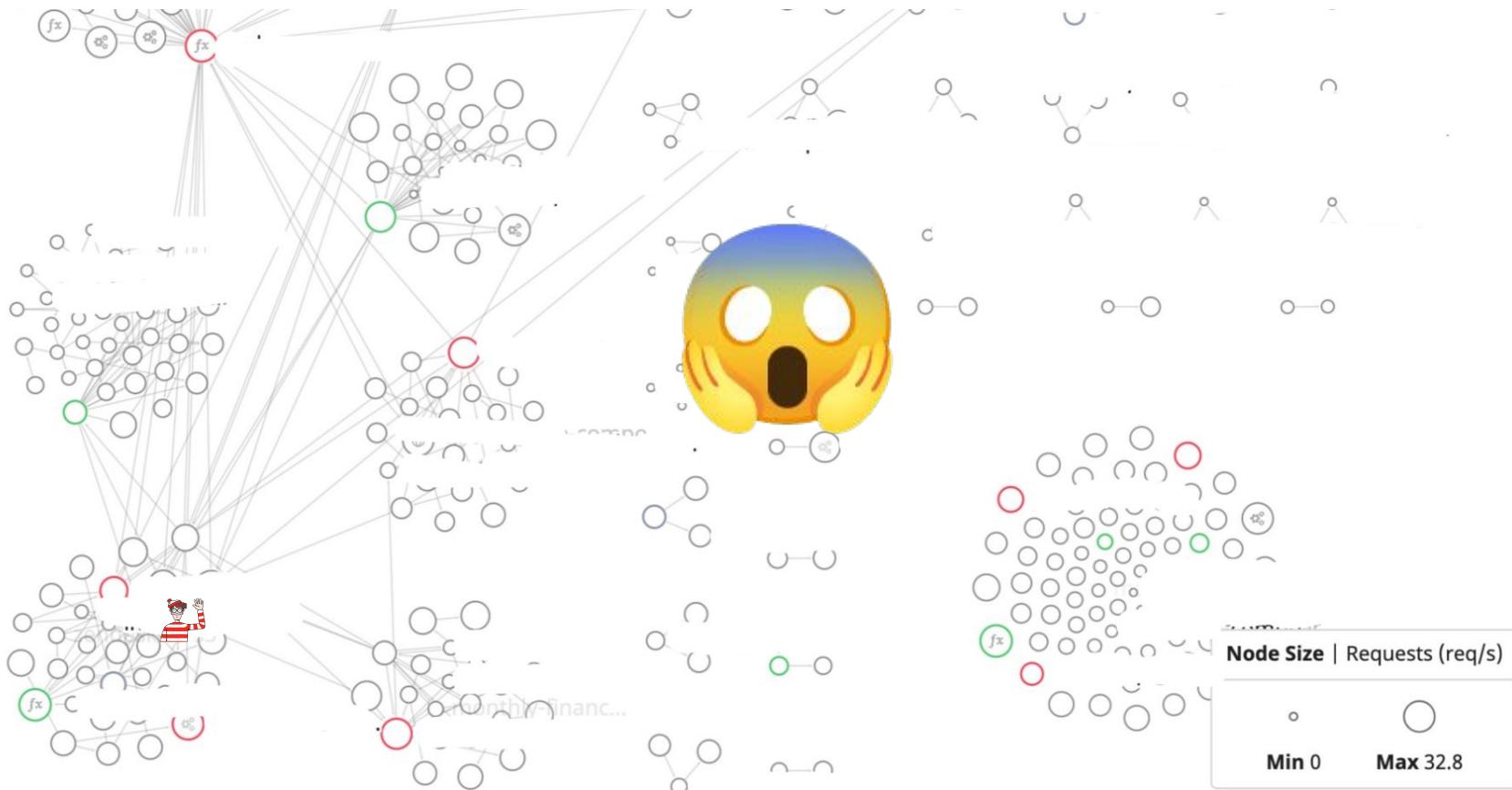


It's not enough to **deliver** well, you need to **operate reliably** too.

# Build, ship, support



Systems are  
**complex.**



So, we need it.

How can **you**  
establish a  
culture of  
Observability?

# 1. Choose an observability tool

1. Choose an observability tool

2. “Enable” telemetry data

1. Choose an observability tool

2. “Enable” telemetry data

3. Auto-generate the dashboard

1. Choose an observability tool
2. “Enable” telemetry
3. Auto-generate dashboards





MOVIECLIPS.COM

**Observability** is the **testability** of  
the 2020s, but  
**better.**

**Tests** tell you what's broken

**Tests** tell you what's broken

**Observability** tells you what's happened

# Testability



# Observability

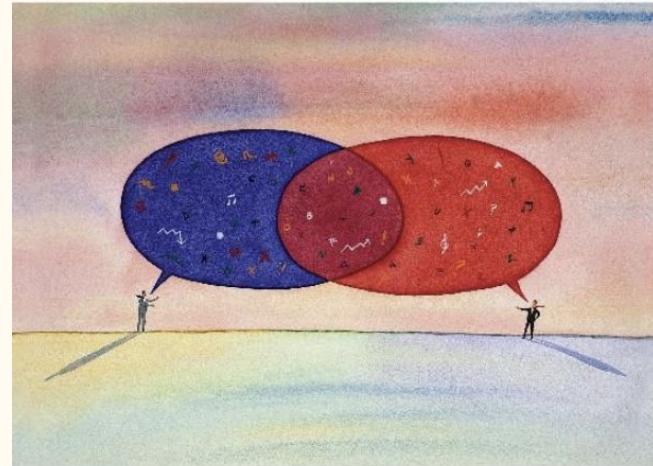


O'REILLY®

*"Truly, a blueprint for the systems of tomorrow."*  
—Mike Dvorkin, Distinguished Engineer at Cisco

# THINKING IN PROMISES

DESIGNING SYSTEMS FOR COOPERATION



What **promise** are  
we keeping with  
**testing?**

MARK BURGESS

I **promise** that I will change the software, and it **won't get worse.**

I **promise** that I will change the software, and it **won't get worse**.

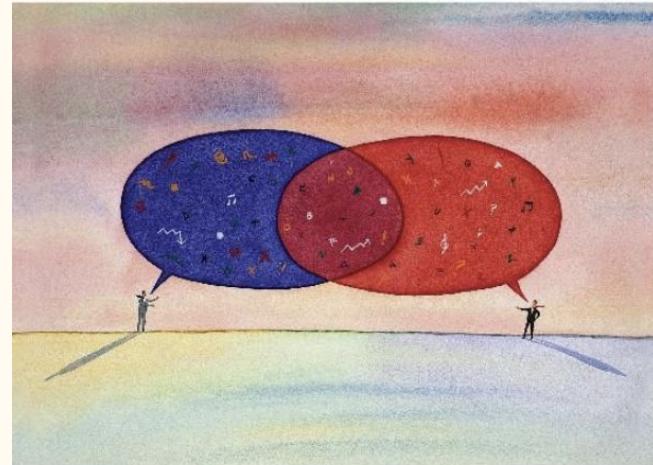
If anything, it will **get better**.

O'REILLY®

*"Truly, a blueprint for the systems of tomorrow."*  
—Mike Dvorkin, Distinguished Engineer at Cisco

# THINKING IN PROMISES

DESIGNING SYSTEMS FOR COOPERATION

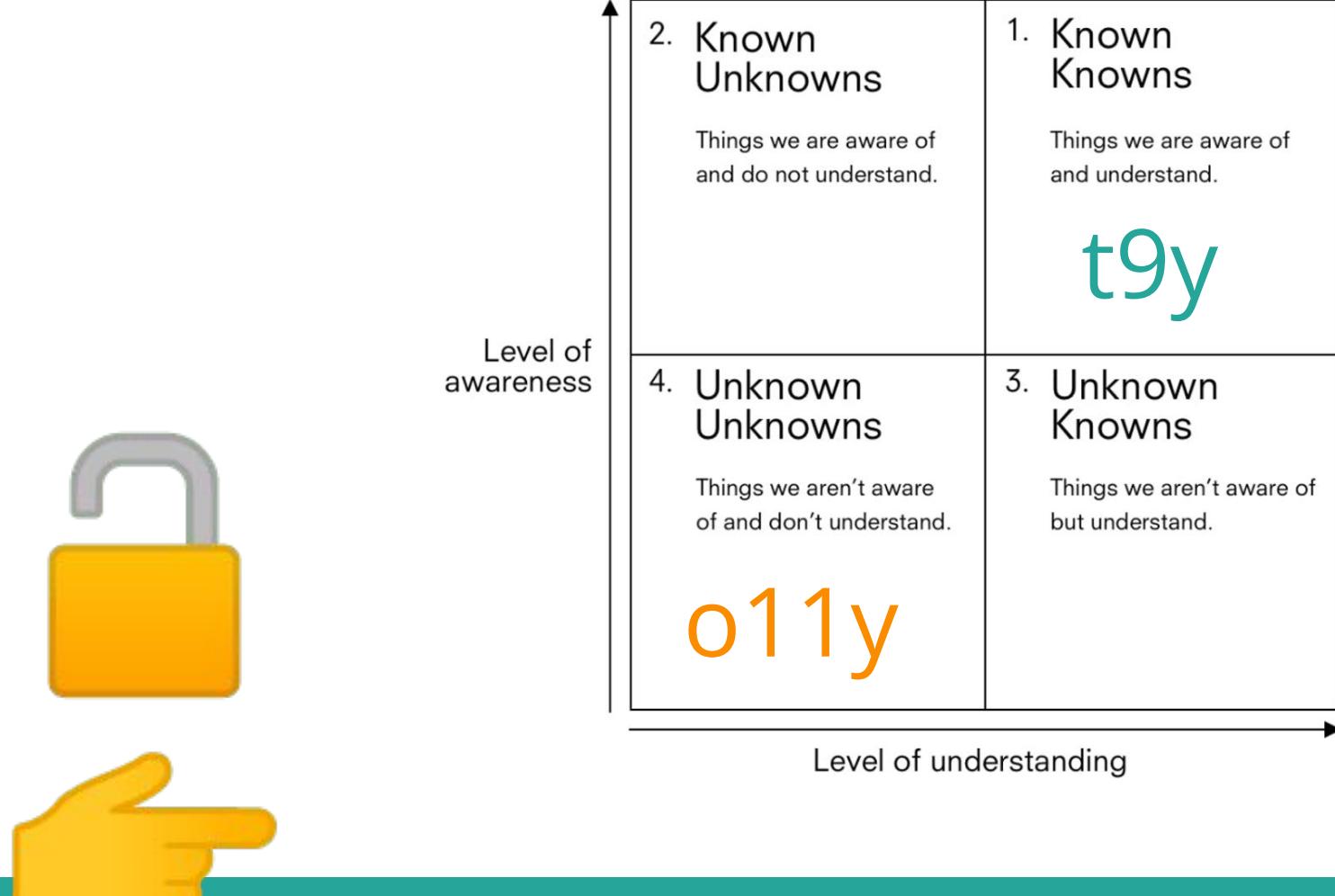


# What **promise** are we keeping with **observability**?

MARK BURGESS

I **promise** that you will **have a**  
**service,**  
and you can **rely** on me.

If I make a change, I **promise** that  
your service will **get better**, and I  
**will know** if it doesn't.



**OK,** what do I do?

Improve how we  
**create & curate**  
our telemetry data to  
**enable observability.**

Where do I  
**start?**

 Pick **o11y tool** & let everyone have it **Instrument** code Support & enable **learning**



# Pick o11y tool & let everyone have it



- Instrument code



- Support & enable learning

How do I  
**choose?**



Can **everyone** use the service with no extra cost?



Can **everyone** use the service with no extra cost?



Does the vendor have excellent **DX tooling**?

 Can **everyone** use the service with no extra cost?

 Does the vendor have excellent **DX tooling**?

 How far do you get **without checking production**?

 Can **everyone** use the service with no extra cost?

 Does the vendor have excellent **DX tooling?**

 How far do you get **without checking production?**

 Can you manage **billing** effectively?

# Established



# Start-ups



# Serverless





Pick o11y tool & let everyone have it



Instrument code



Support & enable learning



Pick o11y tool & let



Instrument code



Support & enable



```
orderPlaced(orderEvent) {
```

```
    tag(orderId, "X")
```

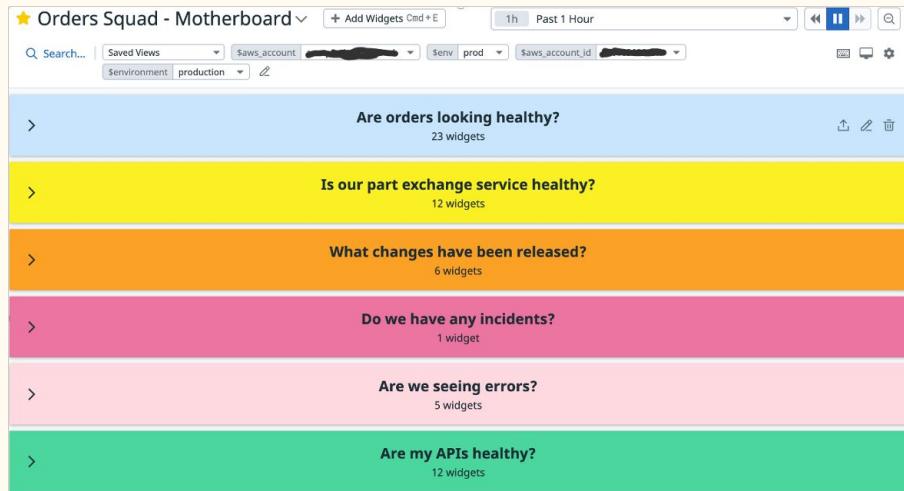
```
    tag(userId, "Y")
```

```
    <business logic>
```

```
    tag(orderPlaced, true)
```

```
}
```

```
orderPlaced(orderEvent) {  
    tag(orderId, "X")  
    tag(userId, "Y")  
    <business logic>  
    tag(orderPlaced, true)  
}
```



```
orderPlaced(orderEvent) {
```

```
    tag(orderId, "X")
```

```
    tag(userId, "Y")
```

```
    <business logic>
```

```
    tag(orderPlaced, true)
```

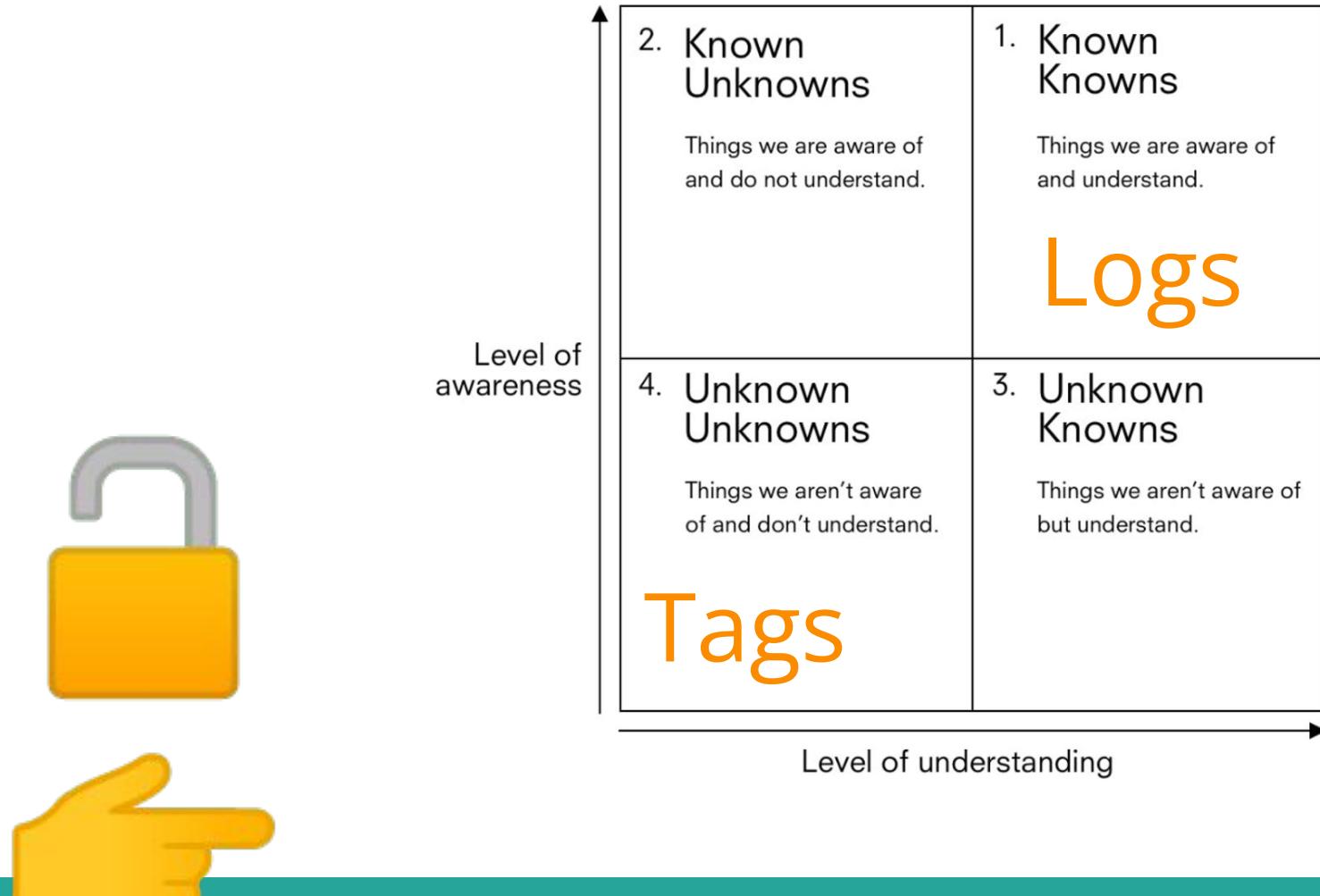
```
}
```

The screenshot shows a monitoring dashboard titled "Orders Squad - Motherboard". The top navigation bar includes "Add Widgets Cmd + E", a time range "1h Past 1 Hour", and filters for "Saved Views", "\$aws\_account", "\$env prod", and "\$aws\_account\_id". Below the header, there are six colored cards, each representing a different health check:

- Blue card: "Are orders looking healthy?" (23 widgets)
- Yellow card: "Is our part exchange service healthy?" (12 widgets)
- Orange card: "What changes have been released?" (6 widgets)
- Pink card: "Do we have any incidents?" (1 widget)
- Light Blue card: "Are we seeing errors?" (5 widgets)
- Green card: "Are my APIs healthy?" (12 widgets)



Learning **how** to  
instrument is  
important



```
log("An order was placed  
with order id = XYZ")
```

**log**("An order was placed  
with order id = XYZ")



**log**("An order was placed  
with order id = XYZ")



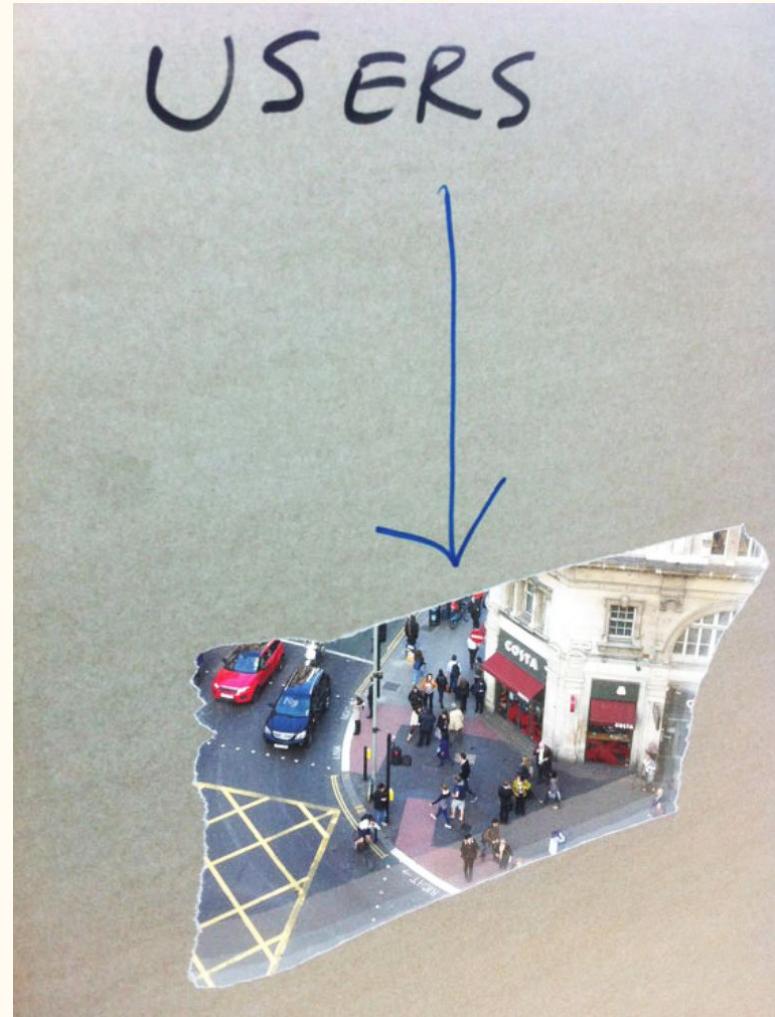
**addTag**("orderId", XYZ)  
**addTag**("userId", ABC)  
**addTag**("orderPlaced", true)



Think of **every** input, output or parameter in your code as an **opportunity** to **learn**.

```
orderPlaced(orderEvent) {  
    tag(orderId, "X")  
    tag(userId, "Y")  
    <business logic>  
    tag(orderPlaced, true)  
}
```

```
orderPlaced(orderEvent) {  
    tag(orderId, "X")  
    tag(userId, "Y")  
    <business logic>  
    tag(orderPlaced, true)  
}
```



You can ask  
**any question.**

**select \* from orderEvent**

```
select * from orderEvent  
where userId=X
```

```
select * from orderEvent  
where orderPlaced=true
```

1 Code

2 Test

3 Instrument

1 Test

2 Code

3 Instrument

1 Test

2 Instrument

3 Code

1 Instrument

2 Code

3 Test



Pick o11y tool & let everyone have it



Instrument code



Support & enable learning

Instrumenting  
**won't** quite cut  
it

...you can **construct the behaviour of a system** from its externally visible components.

*Adrian Cockcroft,  
Hacking The Org podcast  
Charles Humble*



=



How can teams  
make **sense** of  
it?



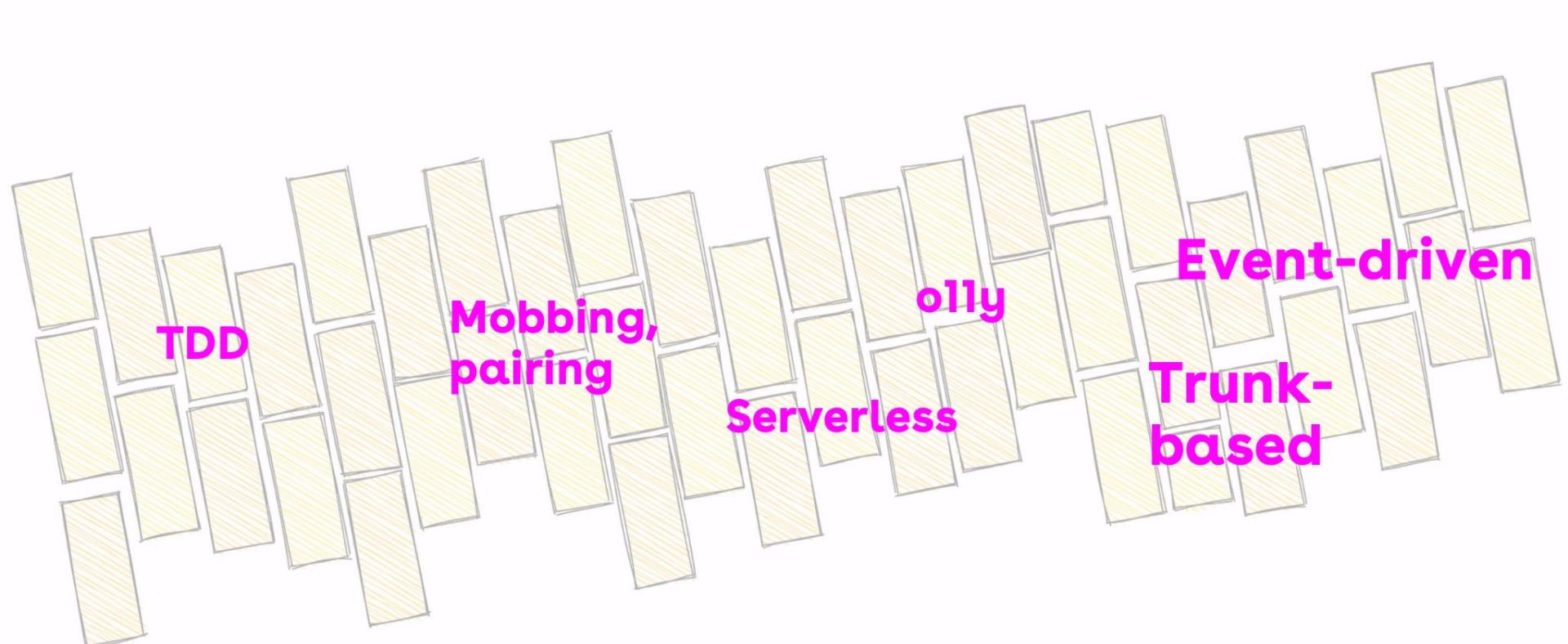
# Support



# Learn



# Practice



TDD

Mobbing,  
pairing

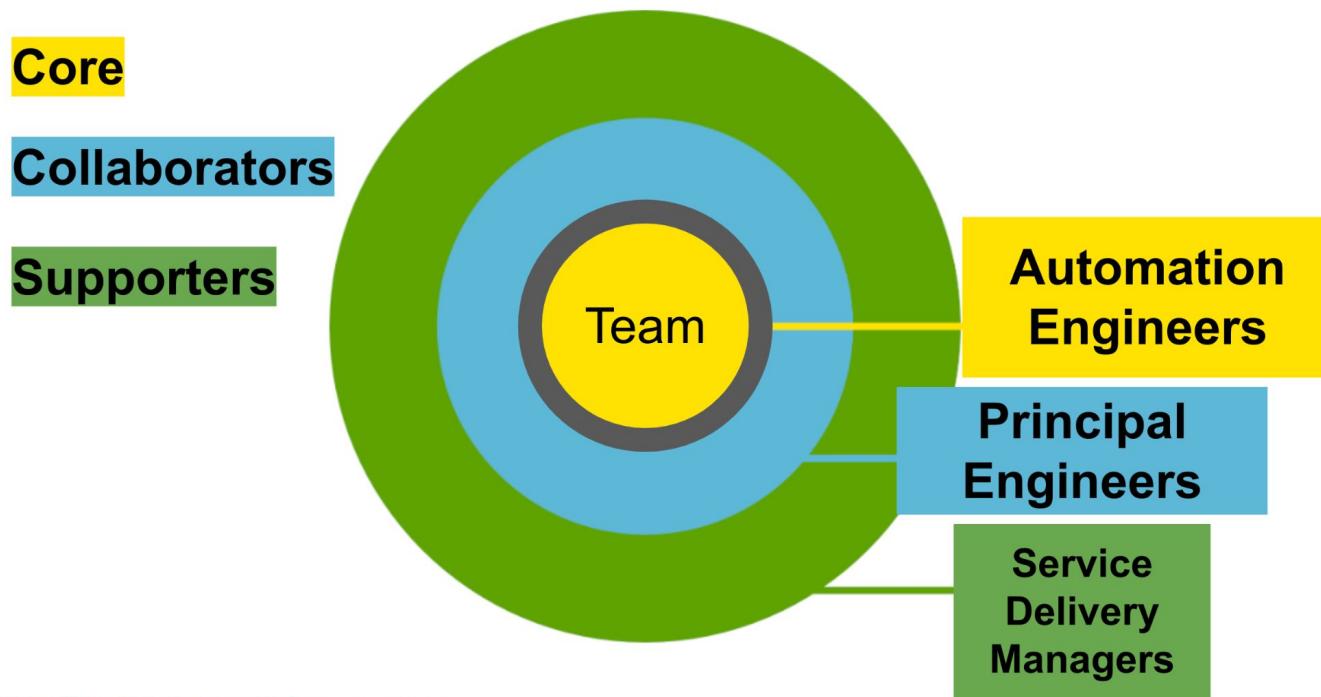
Serverless

o1ly

Event-driven  
Trunk-  
based



Add **o1ly** to your golden path



<https://teamonion.works/>, Emily Webber



# Plant **enablers** into teams



**Community** of Interest

# ★ RUM Datadog Workshop - LI



Created by Sarika Antony

Last updated 12 days ago

RUM Datadog Workshop ...

- [Introduction 🎬](#)
- Warm up - Personal...
  -
- RUM 📈
  - Quick Intro
  - UX Monitoring - Re...
- Instrumenting Cust...
  - Browsing the Docu...
  - Frontend Telemetry
- Feedback time 🕒

## Introduction 🎬

---

In this session, you will learn to navigate yourself around the Datadog UI and understand the various Datadog views and products that underpin cinch's observability and monitoring platform.

To start with you can have a quick glance at:

- [DevOps Useful Resources](#)
- [Datadog Glossary reference](#)
- [Miro visual reference of products](#)
- [Miro visual reference of Data Sources](#)
- [Miro visual reference of Data Visualisation](#)



# O11y workshops

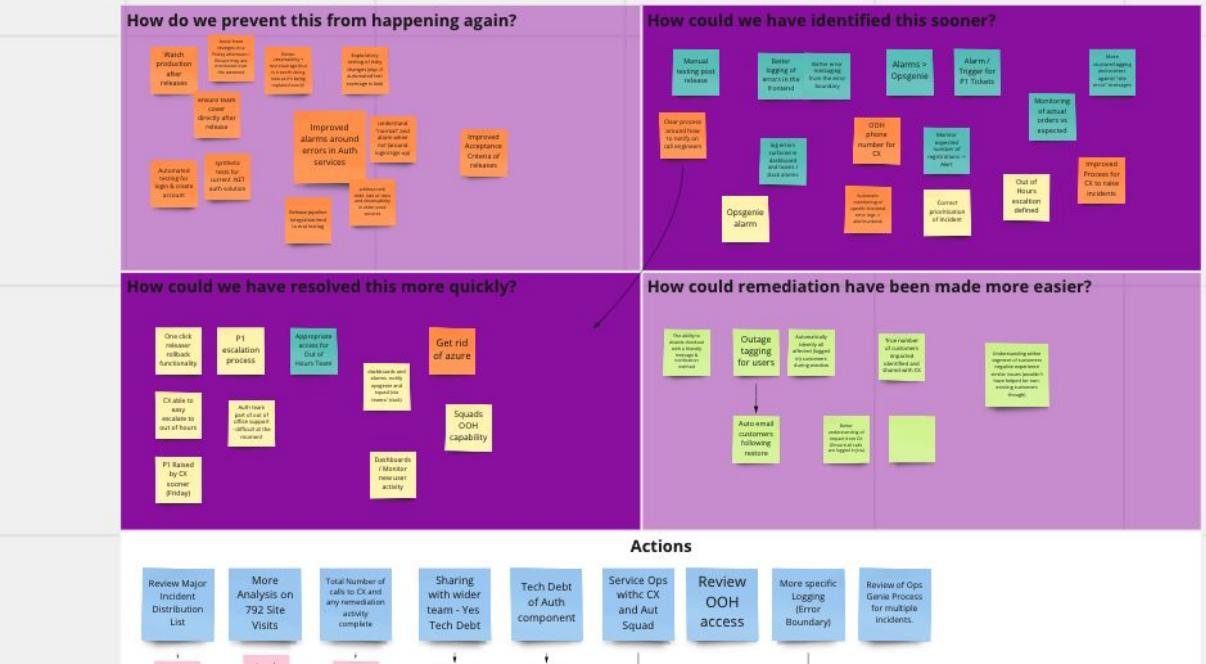
# Dr. Ron Westrum's 'Three Cultures Model'

PATHOLOGICAL	BUREAUCRATIC	GENERATIVE
Power-oriented	Rule-oriented	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 = scapegoating	Failure = justice	Failure = inquiry
Novelty crushed	Novelty = problems	Novelty implemented



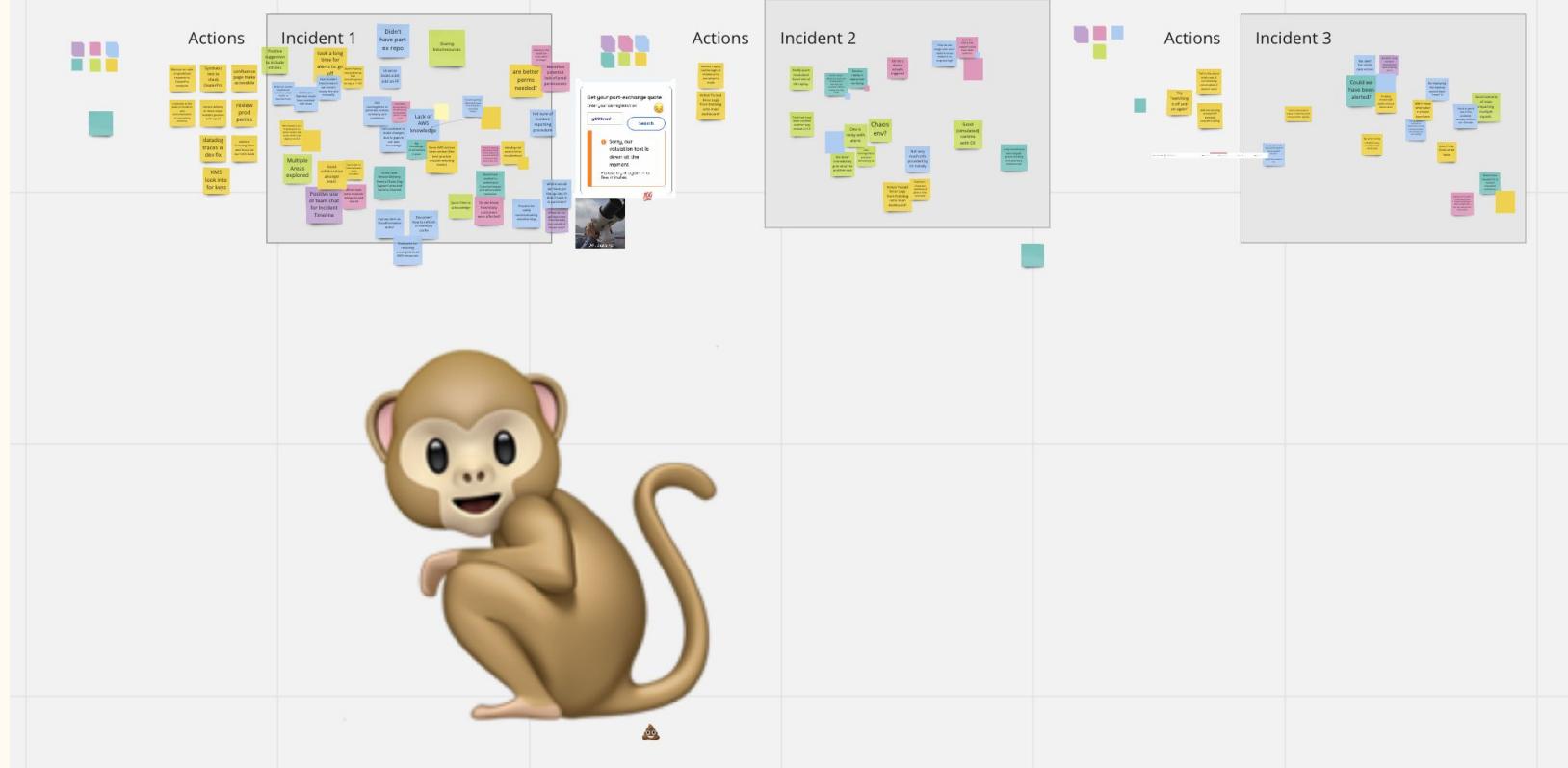
Psychological **safety**

10/11/12 - ST-1050 - Unable to create account



# Incident reviews

Frame 1



# Regular Chaos Days

# Working Group API: O11y Blueprints



Created by Greg Farrow, with a template

Last updated: Jun 23, 2022 by Apostolis Apostolidis • 3 min read • 49 people viewed

[🕒 Recently updated](#) | [ℹ️ Overview](#) | [🤔 What is the problem?](#) | [🎯 Goals](#) | [📝 Kill Criteria](#) | [🚫 What is out of scope?](#) | [💬 How are we collaborating?](#) | [📣 Team news](#) | [📝 Relevant Documents](#) | [✖️ Limitations & Concerns](#) | [🔮 Future Work](#)

## 🕒 Recently updated

- [2022-03-10 | O11y Club | Day 17, Hunting for spans](#)  
Mar 16, 2022 • contributed by Paul Richards
- [2022-03-04 | O11y Club | Day 16, The Chain](#)  
Mar 07, 2022 • contributed by Greg Farrow
- [2022-02-03 | O11y Club | Day 10, 11 & 12 – First an apology](#)  
Feb 03, 2022 • contributed by Greg Farrow
- [2022-01-14 | O11y Club | Day 9 – now streaming on cinch-flix: "RUM and the Redaction of the Personal Identifiable Information"](#)  
Jan 19, 2022 • contributed by Paul Richards
- [2022-01-06 | O11y Club | Day 8 – Jest, Test and Seeding DynamoDB](#)  
Jan 13, 2022 • contributed by Greg Farrow

[Show More](#)

	Name	O11y Blueprints
	Status	COMPLETE



# Working Groups

☰ README.md

# cinch-brew

---

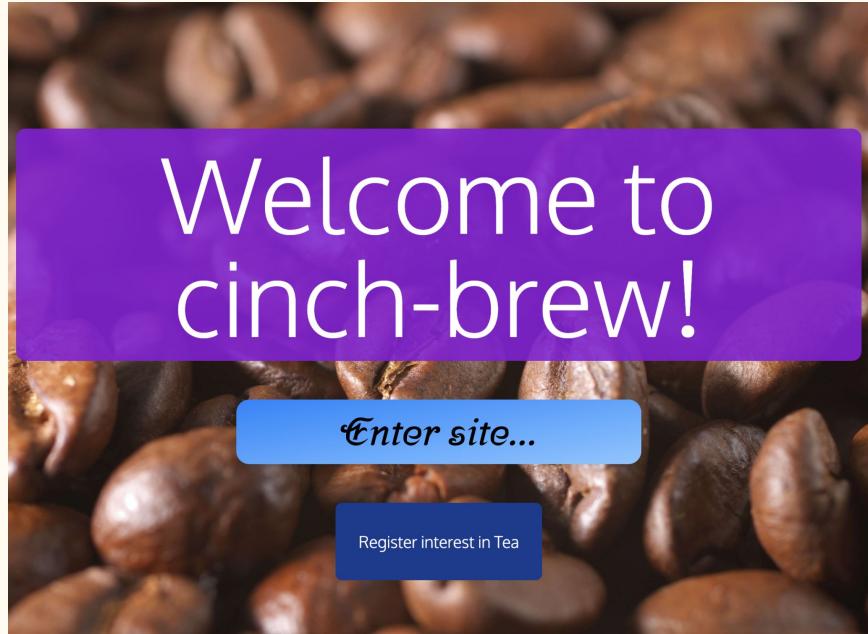
Cinch brew is a fictional software system demonstrating good observability.

The system is designed with common cinch architectural patterns in mind - including backend and frontend.

## An observability blueprint

---

An observability blueprint serves as the educational center for good observability patterns and practices used at cinch. Its purpose is to offer guidance by way of working examples of common scenarios you will come across whilst developing components.



# Code **blueprints**

 Pick o11y tool & let everyone have it Instrument code Support & enable learning

What can  
possibly go  
**wrong?**



# One person knows everything



**One person** knows everything



**Nobody** understands the dashboards



**One person** knows everything



**Nobody** understands the dashboards



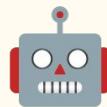
**Overusing** infrastructure-level metrics



# One person knows everything



# Nobody understands the dashboards



# Overusing infrastructure-level metrics



# Know the “what” but not the “why”

When do you  
know you've  
**made it?**

**Team:** o11y is a team responsibility

**Team:** o11y is a team responsibility

**Individual:** o11y practices become core skill

**Team:** o11y is a team responsibility

**Individual:** o11y practices become core skill

**Org:** all teams practice ODD\*

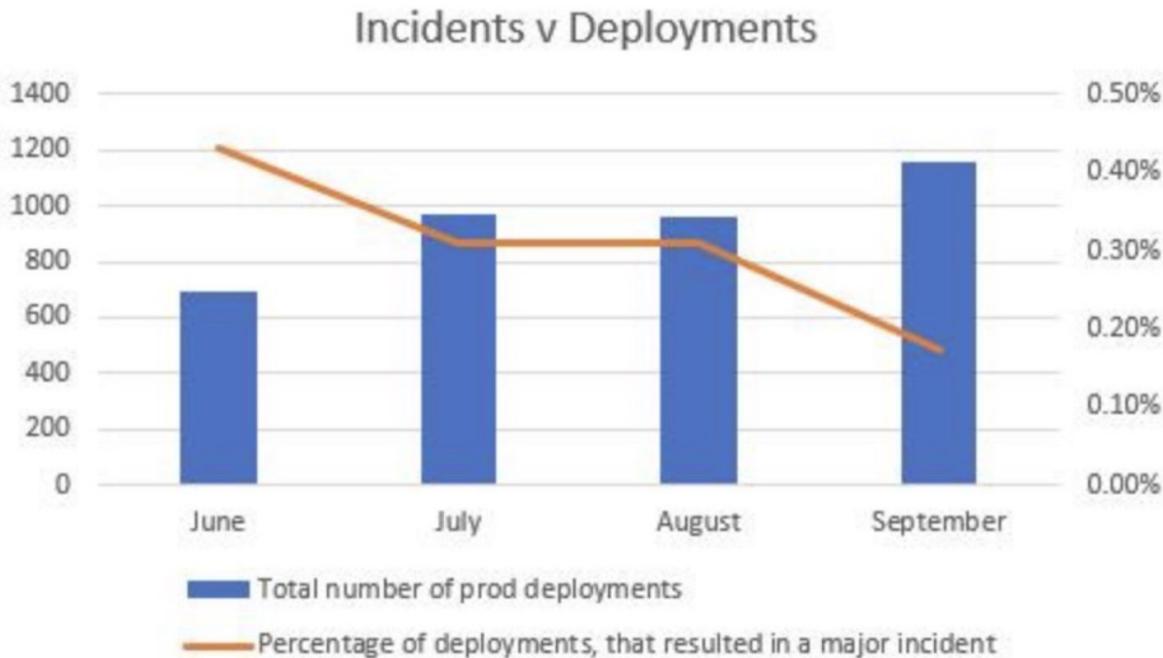
**\*Observability Driven Development**

So **what?**



Observability is **expensive**.

# Incidents are **rare**.



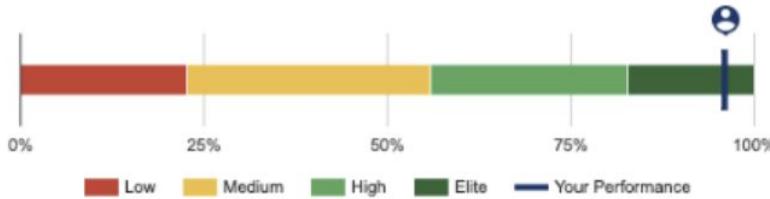
**Mean time to recovery**  
is not an issue.

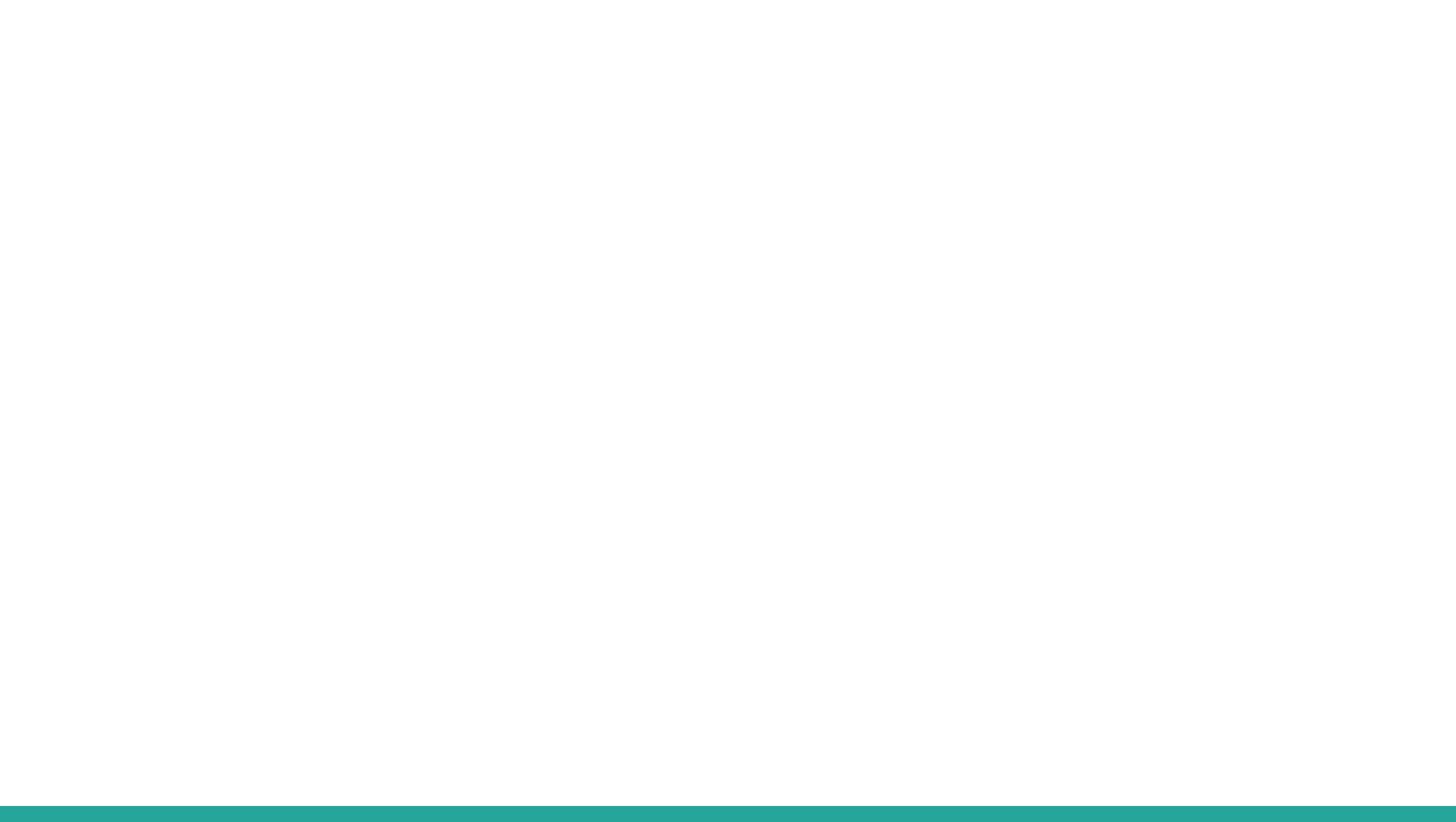
# Your software delivery performance

Your performance:

**Elite**

You're performing better than 96% of [State of DevOps Survey](#) respondents. ⓘ





[Find a car](#)[Car finance](#)[Part exchange](#)[How cinch works](#)[News & reviews](#)[My profile](#)

## Electric Deal!

Get up to **£2000** off selected electric cars plus **£500 charging**  
on us with cinchCharge. T&Cs Apply.

[Shop cars on offer](#)

Select make

Select model

[Search all 6,501 cars](#)

Not sure where to start? Try our [Help Me Choose tool](#)



Excellent  Trustpilot

★ Orders Squad - Motherboard ▾ + Add Widgets Cmd+E 1h Past 1 Hour ▾ ⏪ ⏴ ⏵ ⏵

Q Search... Saved Views \$aws\_account [REDACTED] \$env prod \$aws\_account\_id [REDACTED]

\$environment production



# ★ Orders Squad - Motherboard

+ Add Widgets Cmd + E

1h Past 1 Hour



Q Search...

Saved Views

\$aws\_account

[REDACTED]

\$env

prod

\$aws\_account\_id

[REDACTED]



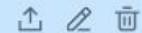
\$environment

production



## Are orders looking healthy?

23 widgets



🔍 Search...

Saved Views

\$aws\_account

██████████

\$env

prod

\$aws\_account\_id

██████████



\$environment

production



## Are orders looking healthy?

23 widgets



## Is our part exchange service healthy?

12 widgets

🔍 Search...

Saved Views

\$aws\_account

██████████

\$env

prod

\$aws\_account\_id

██████████



\$environment

production



&gt;

**Are orders looking healthy?**

23 widgets



&gt;

**Is our part exchange service healthy?**

12 widgets

&gt;

**What changes have been released?**

6 widgets

🔍 Search...

Saved Views

\$aws\_account

██████████

\$env

prod

\$aws\_account\_id

██████████



\$environment

production



## Are orders looking healthy?

23 widgets



## Is our part exchange service healthy?

12 widgets



## What changes have been released?

6 widgets



## Do we have any incidents?

1 widget

🔍 Search...

Saved Views

\$aws\_account

██████████

\$env

prod

\$aws\_account\_id

██████████



\$environment

production



## Are orders looking healthy?

23 widgets



## Is our part exchange service healthy?

12 widgets



## What changes have been released?

6 widgets



## Do we have any incidents?

1 widget



## Are we seeing errors?

5 widgets

🔍 Search...

Saved Views

\$aws\_account

██████████

\$env

prod

\$aws\_account\_id

██████████



\$environment

production



## Are orders looking healthy?

23 widgets



## Is our part exchange service healthy?

12 widgets



## What changes have been released?

6 widgets



## Do we have any incidents?

1 widget



## Are we seeing errors?

5 widgets



## Are my APIs healthy?

12 widgets

How is o11y  
**democratised?**

The more **observable** our systems,  
the more democratised our  
**understanding\***

**\*of our software systems is across the org**

o11y

# Business Analytics & Data Intelligence

Observability is **blurring** the lines.

# BA friendly intro to Observability



I didn't realise this was a technical hack day

BAs can join in too. Sit down



Observability: A Lizard's way of thinking



Imagine this guy turns up to his first working day at cinch.

He's so drunk, he can't speak. We have a problem here. How did this happen?



Let's check the dashboard and the traces



We can identify via the contextual information in the receive text lambda that a text from "our kid" was received at 8pm last night. This text has subject "pub, just for one?"



The "leave house" lambda was invoked last night at 8:30 pm



We can see pub in the logs, which lasted 4 hours



The "Mojo" lambda was triggered at 1am. The alert for Jagerbombs went off at 1:05am.

**YOU SEE**

**OBSERVABILITY ISN'T  
JUST FOR TECHNICAL PEOPLE**

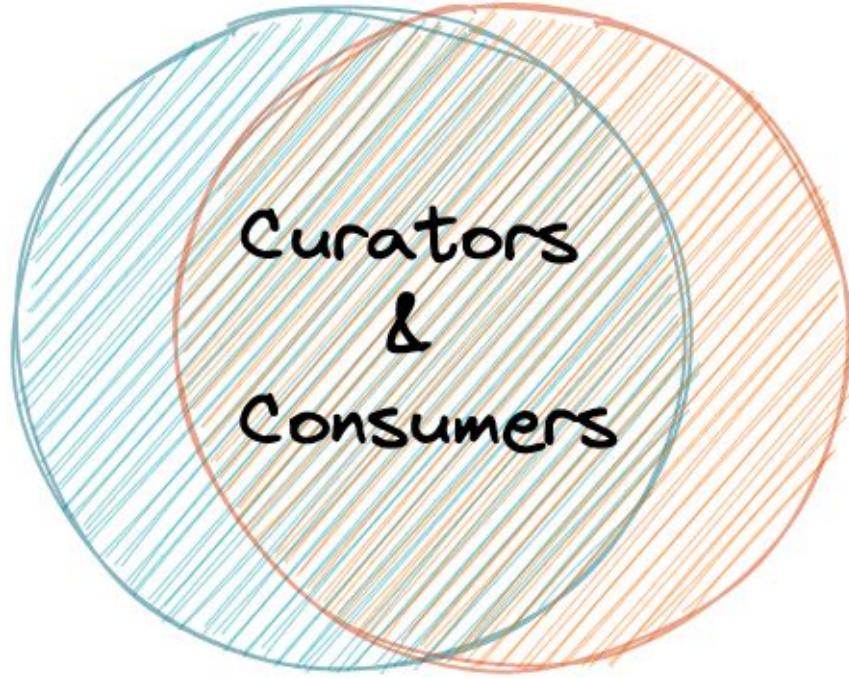
**Thanks for listening!**

Understanding the software is  
**only as good**  
as your telemetry data.



**Software Engineers**

**Business Analysts**



**Software Engineers**

**Business Analysts**

Just like **DevOps**.

“Devs” have taken **ownership** of the **quality** of the telemetry data.

### Multiple Cards

Multiple Cards Selection

**16.12%**

Users selecting multiple cards

**208**

Select Multiple Cards => Verify Cards => Confirm & Pay

Below are the total orders that enter each stage of the flow.

### Single Card

Single Card Selection

**83.88%**

Users selecting single card

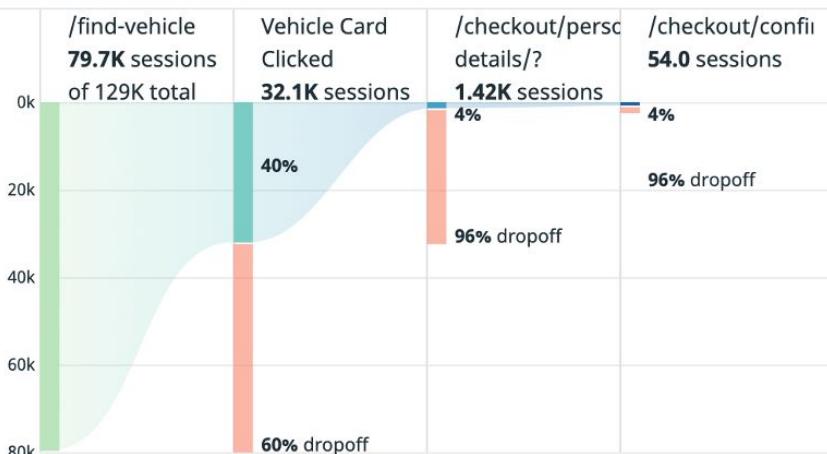
**1.08k**

Select Single Cards => Confirm & Pay

Below are the total orders that enter each stage of the flow.

## Traffic At A Glance

### Funnel Conversion



### Model Searches

<b>7.87k</b>	Fiesta
<b>7.32k</b>	Golf
<b>6.49k</b>	A-Class
<b>6.00k</b>	Focus
<b>5.23k</b>	A3
<b>4.83k</b>	1 Series
<b>4.11k</b>	3 Series
<b>3.98k</b>	A1
<b>3.85k</b>	Polo

### Search devices

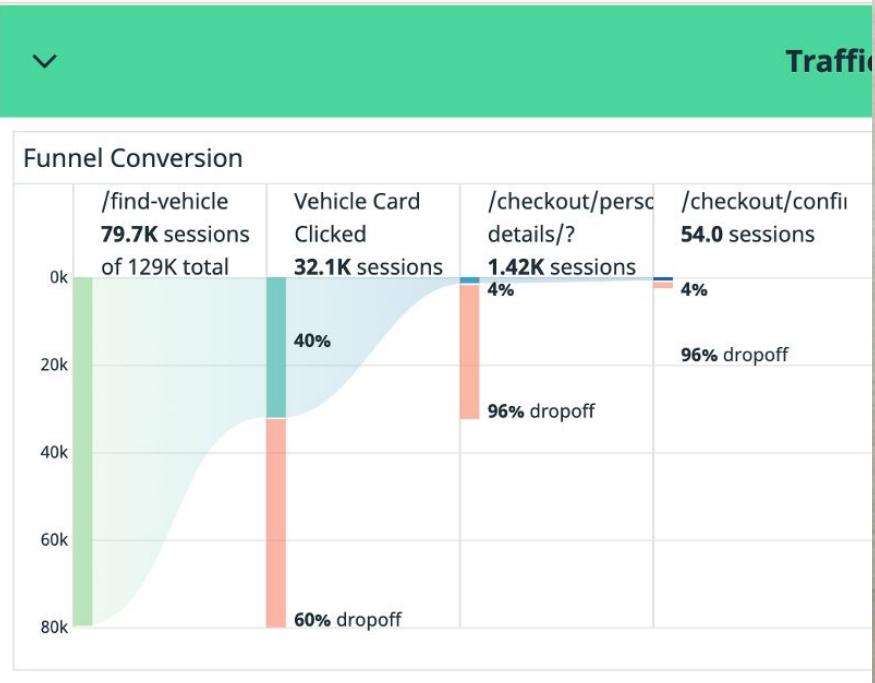
<b>45.33k</b>	Mobile
<b>19.21k</b>	Desktop
<b>3.65k</b>	Tablet
<b>51.00</b>	Bot
<b>3.00</b>	Appliance

### Make Searches

<b>33.88k</b>	BMW
<b>27.16k</b>	Ford
<b>25.99k</b>	Audi
<b>25.43k</b>	Mercedes-Benz
<b>22.70k</b>	Volkswagen
<b>12.08k</b>	Land Rover
<b>11.57k</b>	KIA
<b>11.57k</b>	Vauxhall
<b>9.48k</b>	POD

### Search Browsers

<b>22.61k</b>	Mobile Safari
<b>16.30k</b>	Chrome Mobile
<b>10.28k</b>	Chrome
<b>4.66k</b>	Safari
<b>3.97k</b>	Samsung Internet
<b>3.91k</b>	Edge
<b>3.41k</b>	Google
<b>2.03k</b>	Chrome Mobile iOS
<b>1.87k</b>	Firefox



# Wrapping up



“How do you  
know your code  
is **working in**  
**production?**”



= 20+  
teams  
**practicing**  
**observability**

Observability > Testability



Pick o11y tool & let **everyone** have it

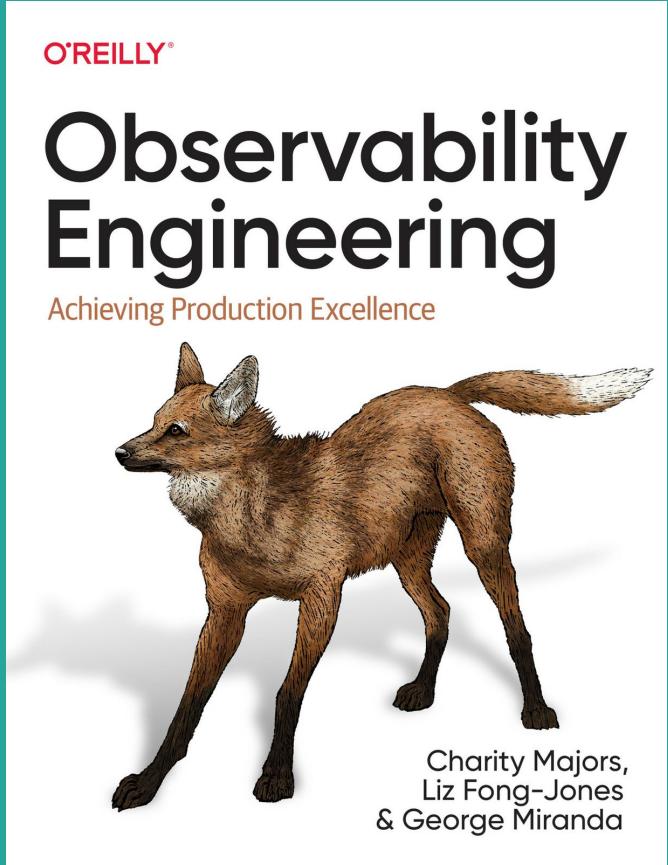


**Instrument** code



Support & enable **learning**

# Read this book





← **Charity Majors**

59.3K Tweets

... Following

## Charity Majors

@mipsytipsy

cofounder/CTO @honeycombi, co-author  
Database Reliability Engineering. I test in pi

② San Francisco charity.wtf Joined

529 Following 77.8K Followers



CHARITY.WTF

### OBSERVABILITY IS A MANY-SPLENDORED DEFINITION

Last weekend, @awyx posted a great little primer to instrumentation titled "Observability Tools in JavaScript". A friend sent me the link and suggested that I might want to respond and clarify some things about observability, so I did, and we had a great conversation! Here is a lightly edited transcript of my [reply tweet storm](#).

First of all, confusion over terminology is understandable, because there are some big players out there actively trying to confuse you! Big Monitoring is indeed actively trying to define observability down to "metrics, logs and traces". I guess they have been paying attention to the interest heating up around observability, and well... they have metrics, logs, and tracing tools to sell! So they have hopped on the bandwagon with some undeniable zeal.

But metrics, logs and traces are just data types. Which actually has nothing to do with observability. Let me explain the difference, and why I think you should care about this.

### "OBSERVABILITY" I DO NOT THINK IT MEANS WHAT YOU THINK IT MEANS."

Observability is a borrowed term from mechanical engineering/control theory. It means, paraphrasing: "can you understand what is happening inside the system — can you understand ANY internal state the system may get itself into, simply by asking questions from the outside?" We can apply this concept to software in interesting ways, and we may end up using some data types, but that's putting the cart before the horse.

  
It's a bit like saying that "database replication means structs, longints and elegantly diagrammed English sentences." Er, no.. yes.. missing the point much?



olly  
cast

Take observability **seriously**, make it work for your use case.

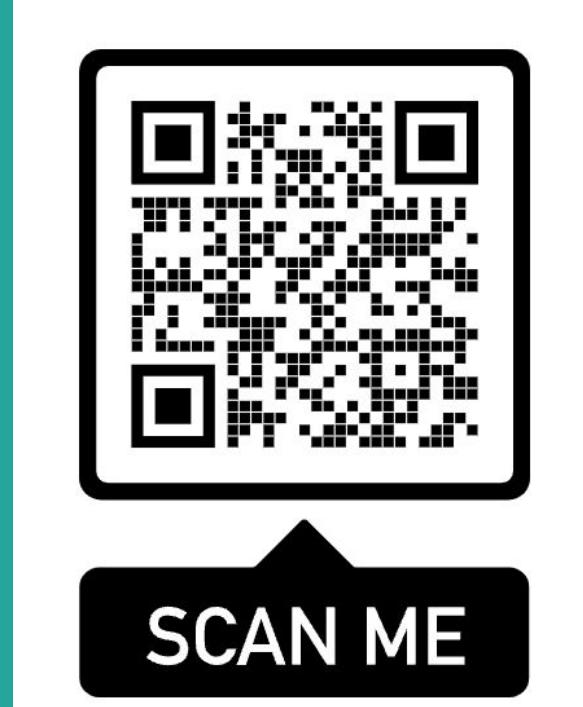
You will **amplify** and **democratise**  
the **understanding** of the **behaviour**  
of your software system

Lack of o11y is our  
**collective tech debt.**

Lack of o11y is our  
**collective tech debt.**

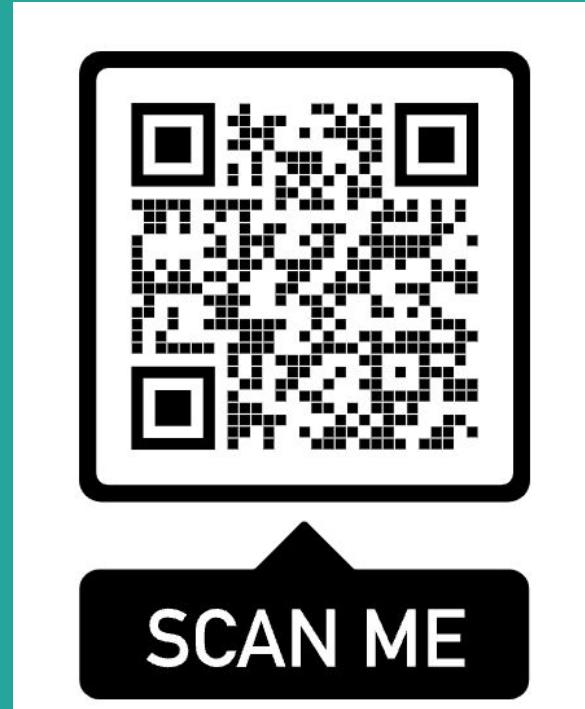
We're now fixing it.

# Thank you



@apostolis09

# Questions?



@apostolis09