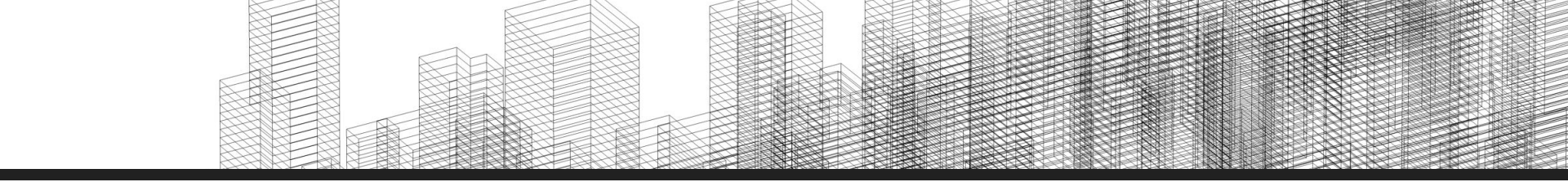
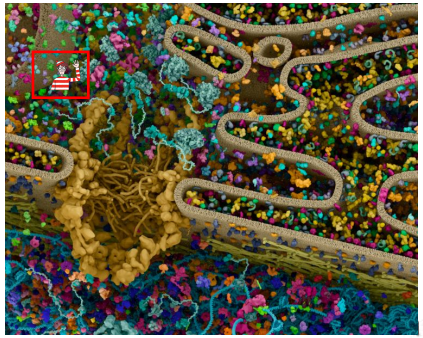


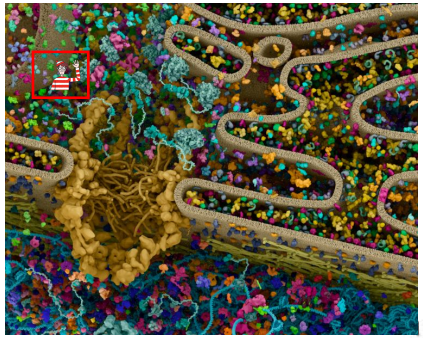
A culture of observing

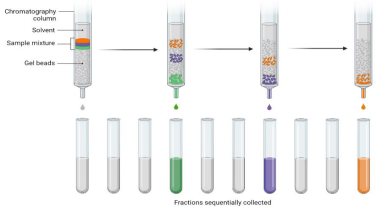
How to get better understanding through observability

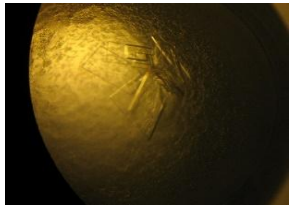
Inside a cell



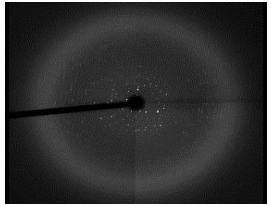
Inside a cell





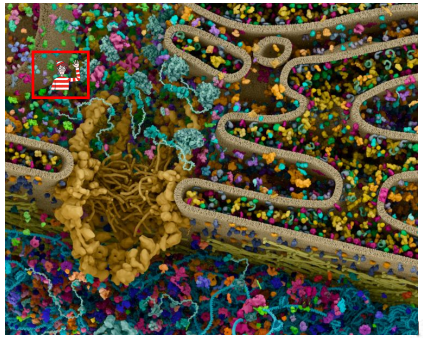


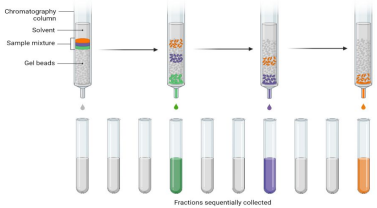
Protein crystals

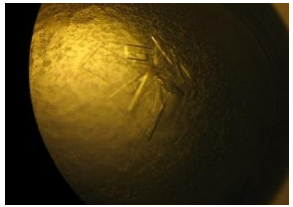


XRay diffraction

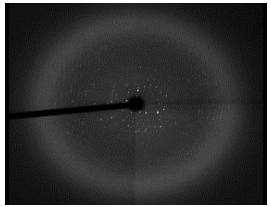
Inside a cell



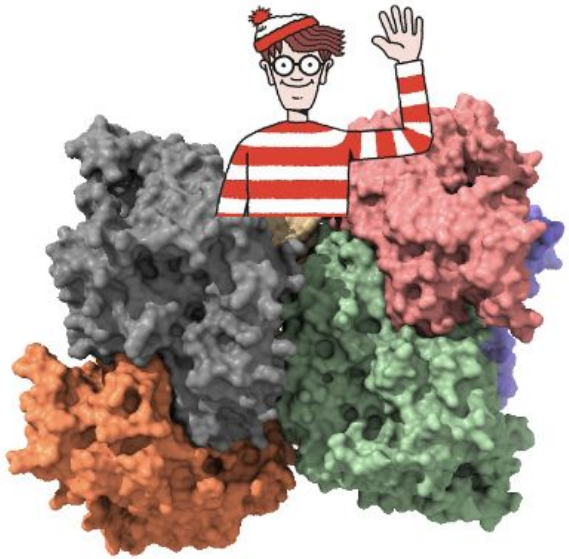




Protein crystals

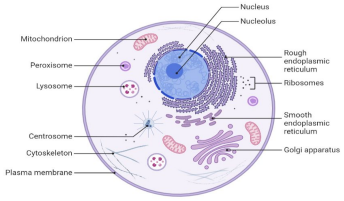


XRay diffraction



2.5 Å

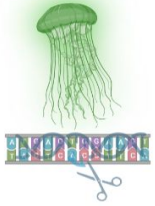
2-7 years

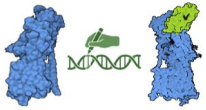


Nucleus

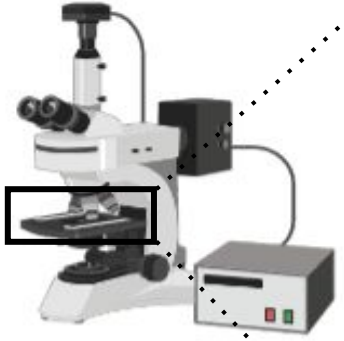
Cell signalling

Prim. Cilium

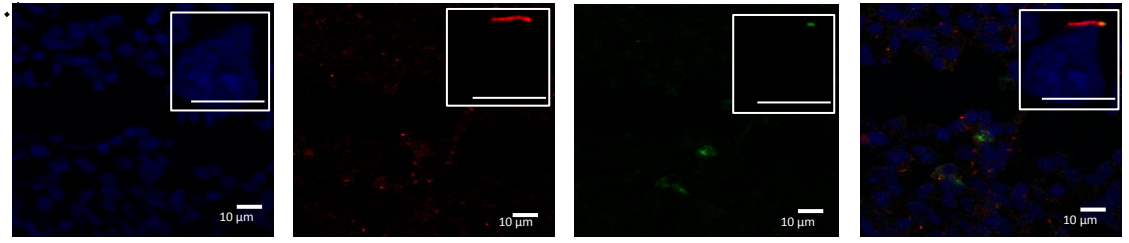


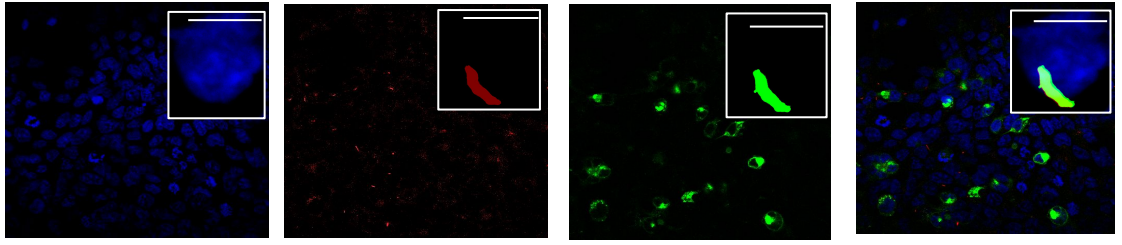


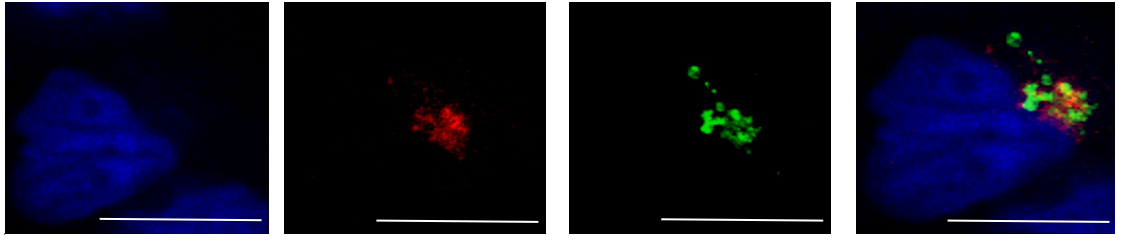
Channels
MERGED



Fluorescent laser microscopy
Live cell imaging

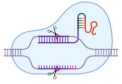




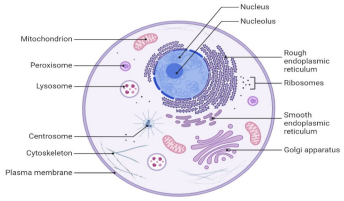


Control

Stimulus



CRISPR/CAS9 Genetic Reprogramming



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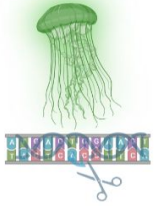

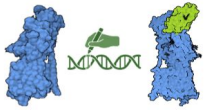

Channels
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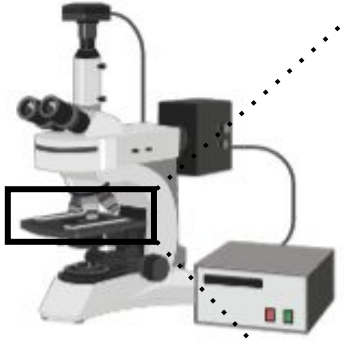
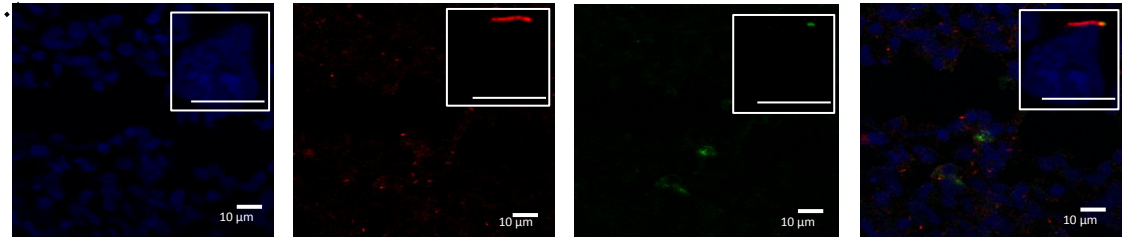
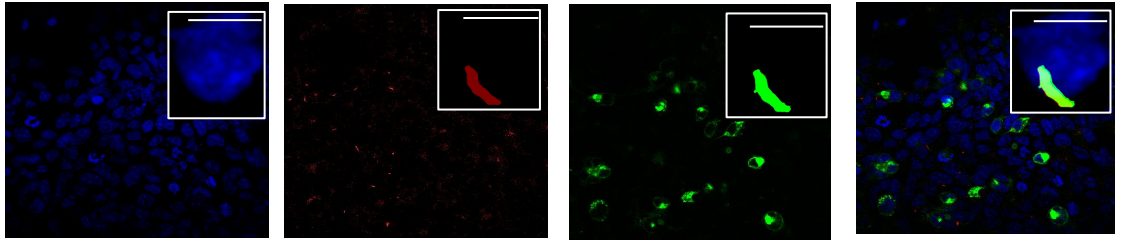
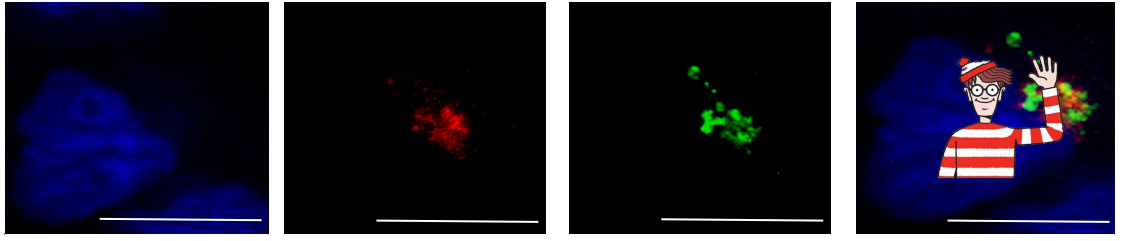


Fluorescent laser microscopy
Live cell imaging

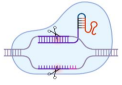






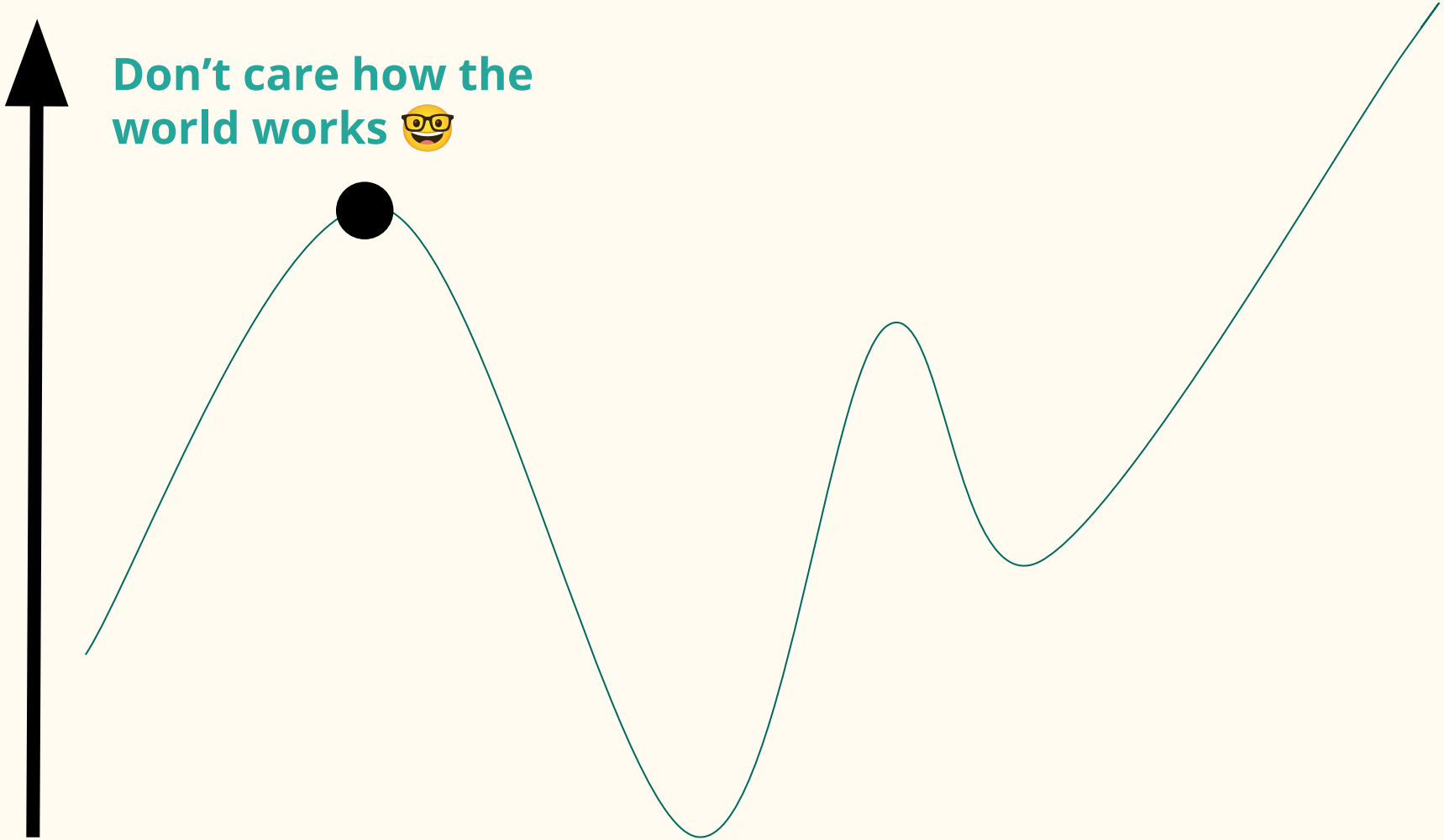
Control

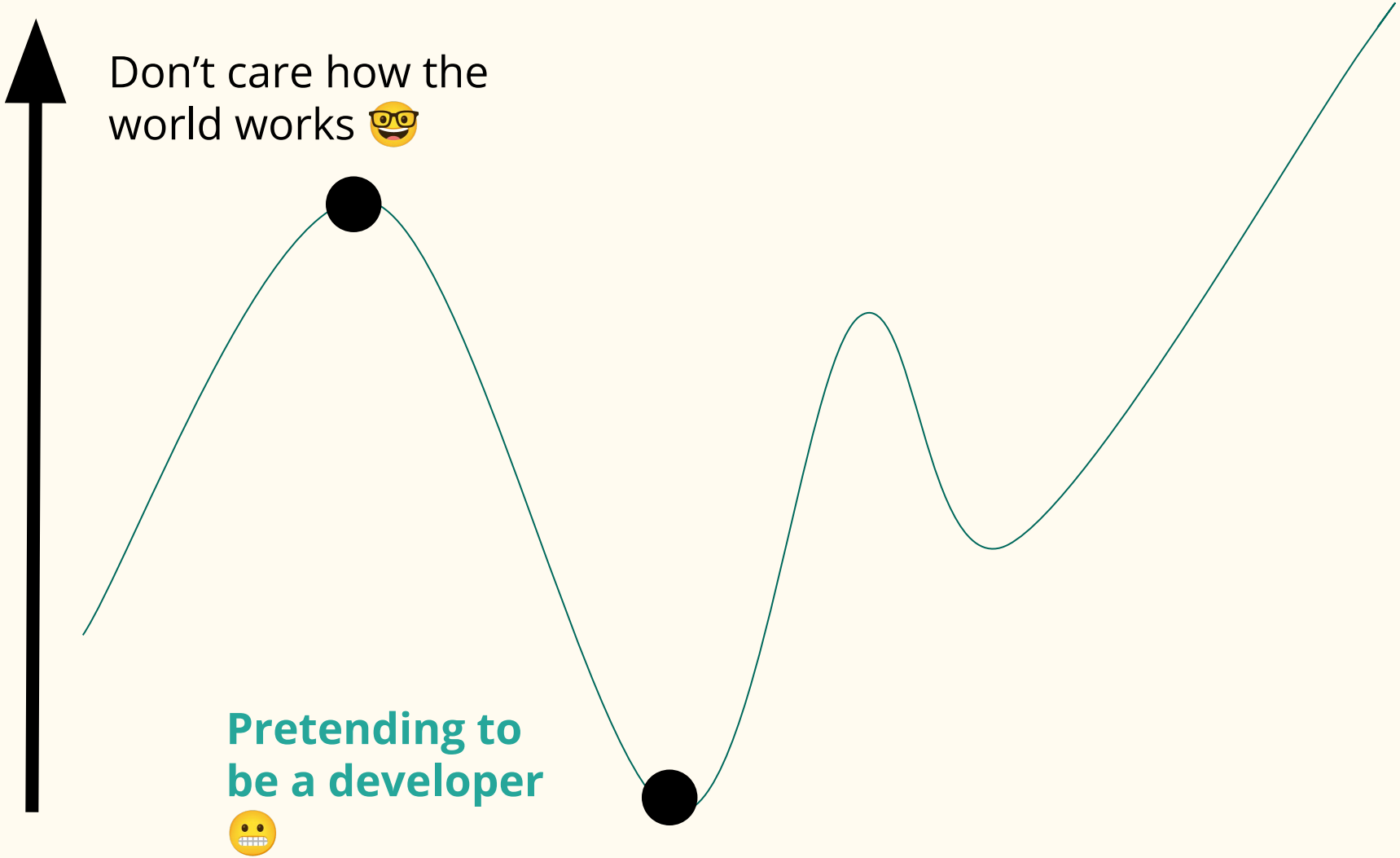
Stimulus

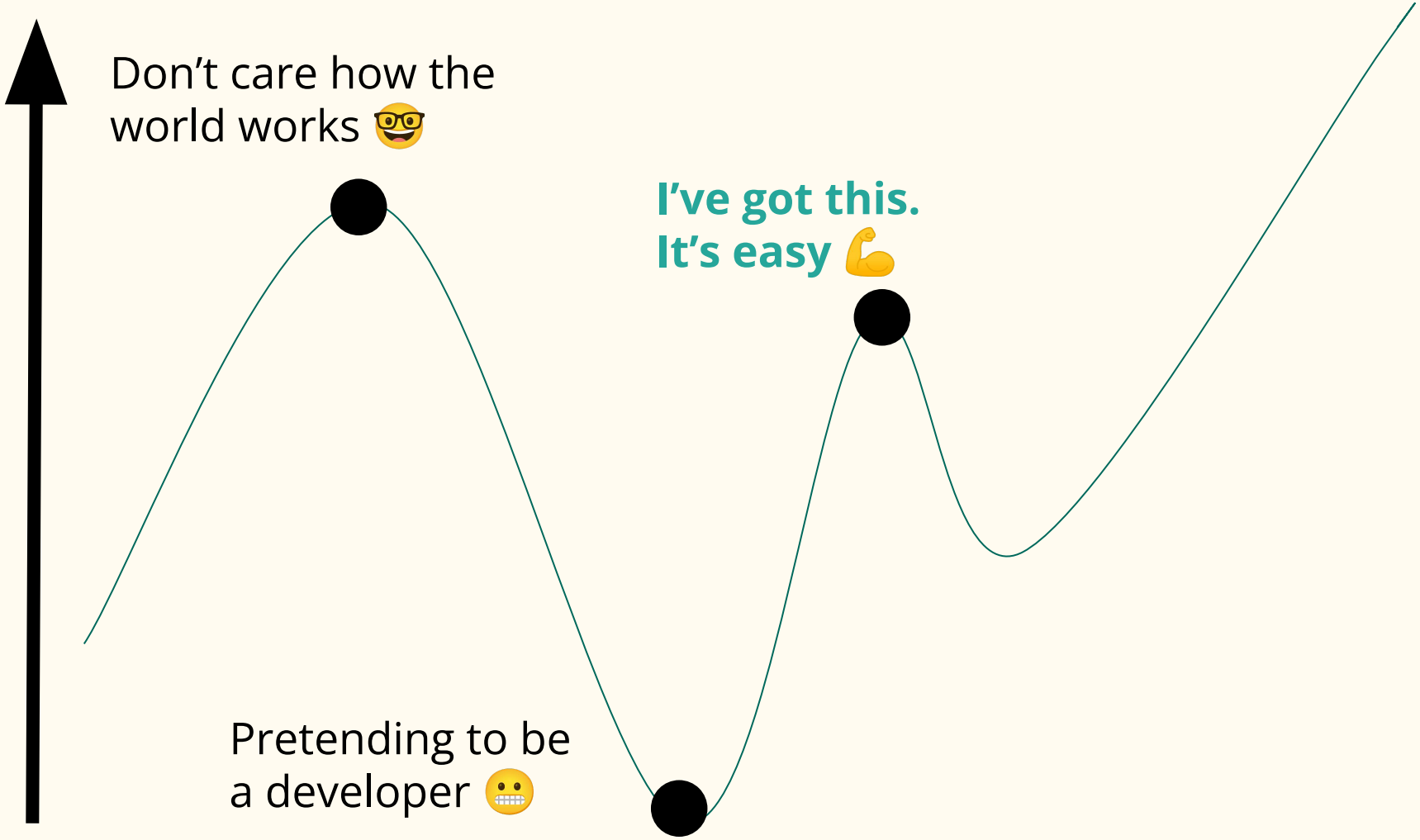


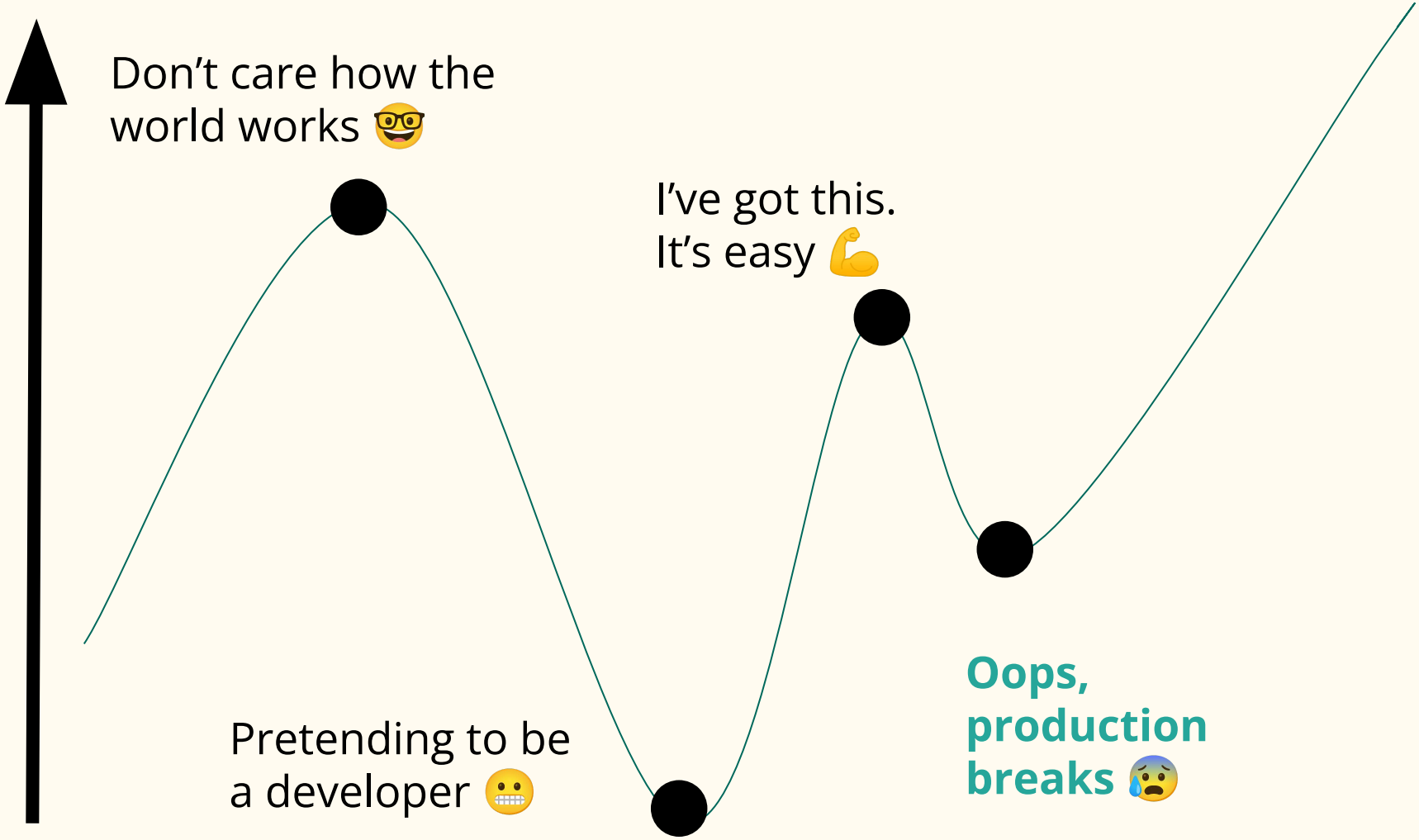
CRISPR/CAS9 Genetic Reprogramming

Don’t care how the world works 🤓




Don’t care how the world works 🤓
Pretending to be a developer 😬


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 🤓
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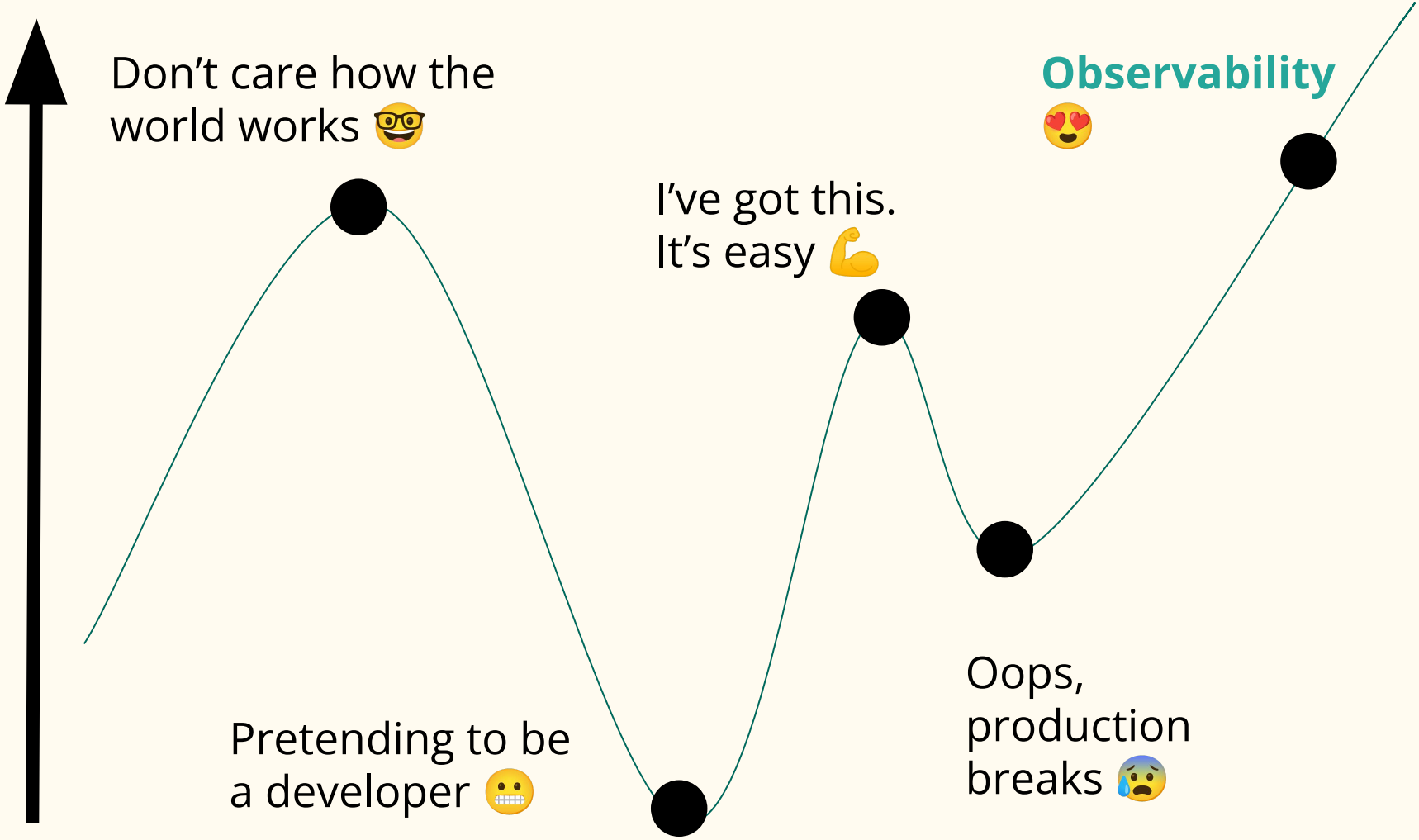
Oops, production breaks 😰


Don’t care how the world works 🤓
Pretending to be a developer 😬
I’ve got this. It’s easy 💪
Oops, production breaks 😰
Observability 😍

observability = o11y

o**observabilit**y = o**11**y

A numeronym

“What about observability?”

“How do you know it will work in production?”

“Have you seen this spike on Datadog?”

“What about observability?”

That’s how you get the nickname

To11y

Toli + o11y 👉

To11y

Apostolis (Toli) Apostolidis

Principal Engineer at Flipdish

@apostolis09

½ 🇬🇷 ½ 🇬🇧

🧘‍♂️ 🏀 ♾️

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 are 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

✅ 🧐 **Explain** any bizarre or novel state

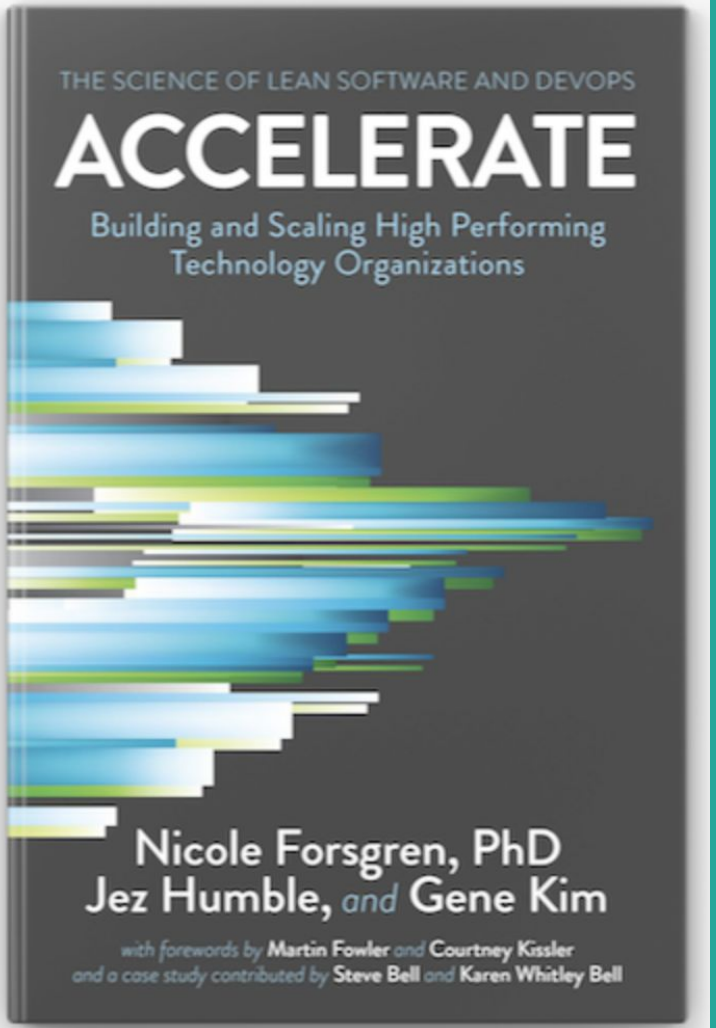
✅ 🛳️ Without shipping **new code**

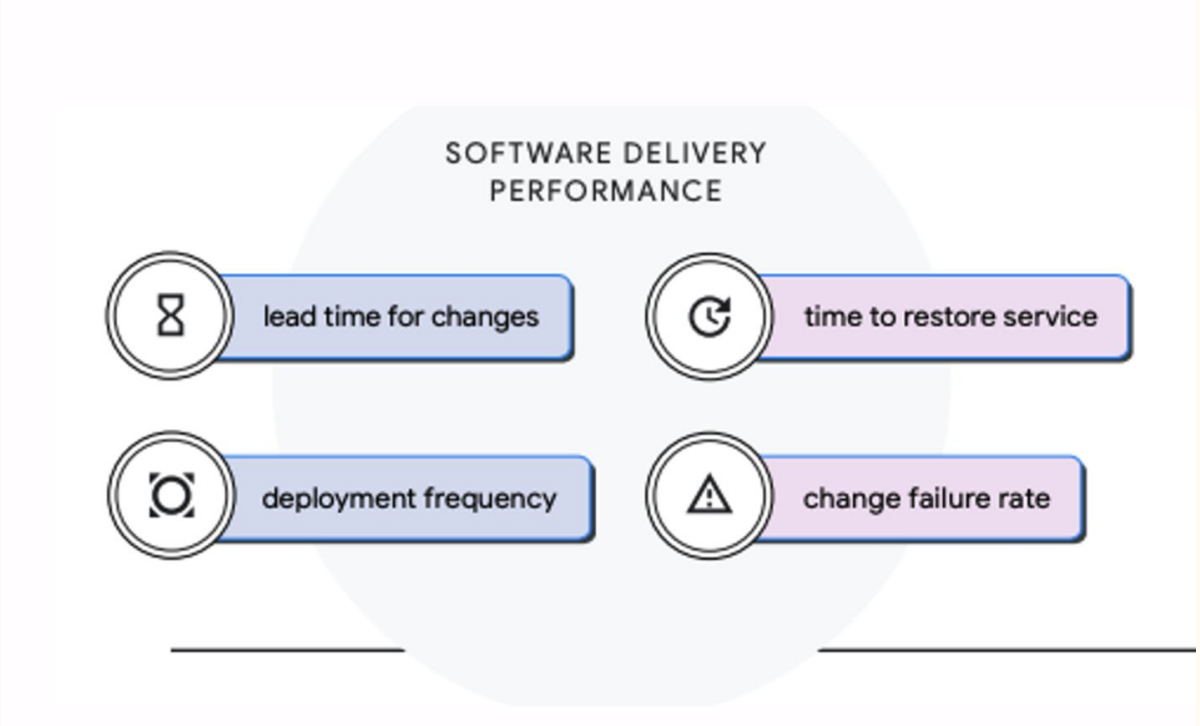
✅ 🔮 Without **predicting** any state

It’s **not** yet another fad.

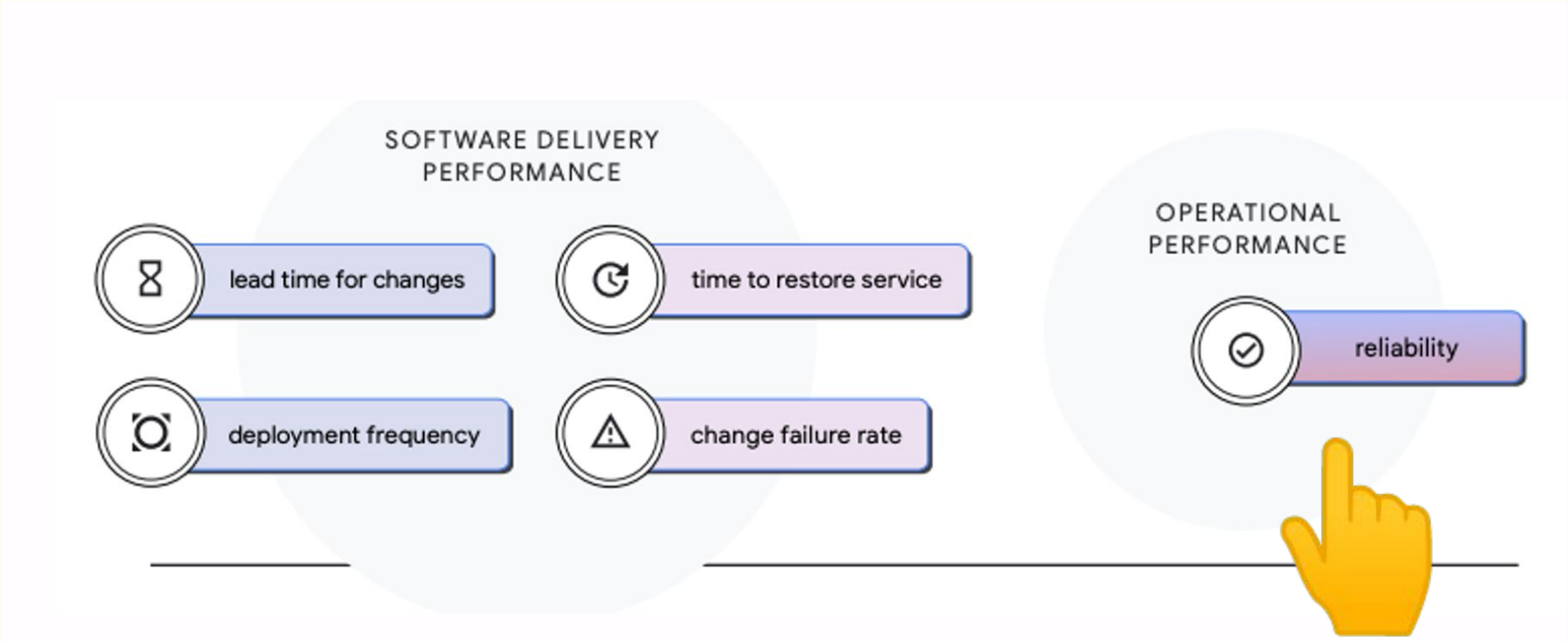
DORA

DEVOPS RESEARCH & ASSESSMENT



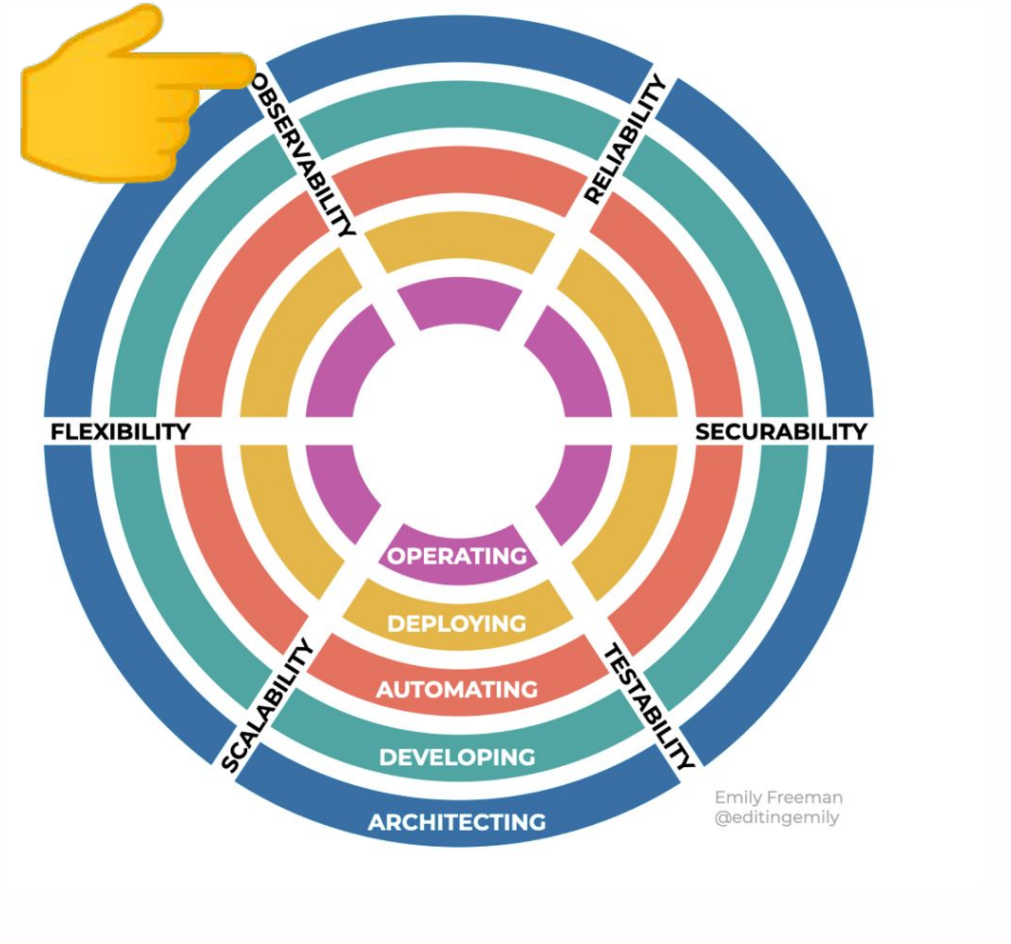


Delivery **predicts** company success



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

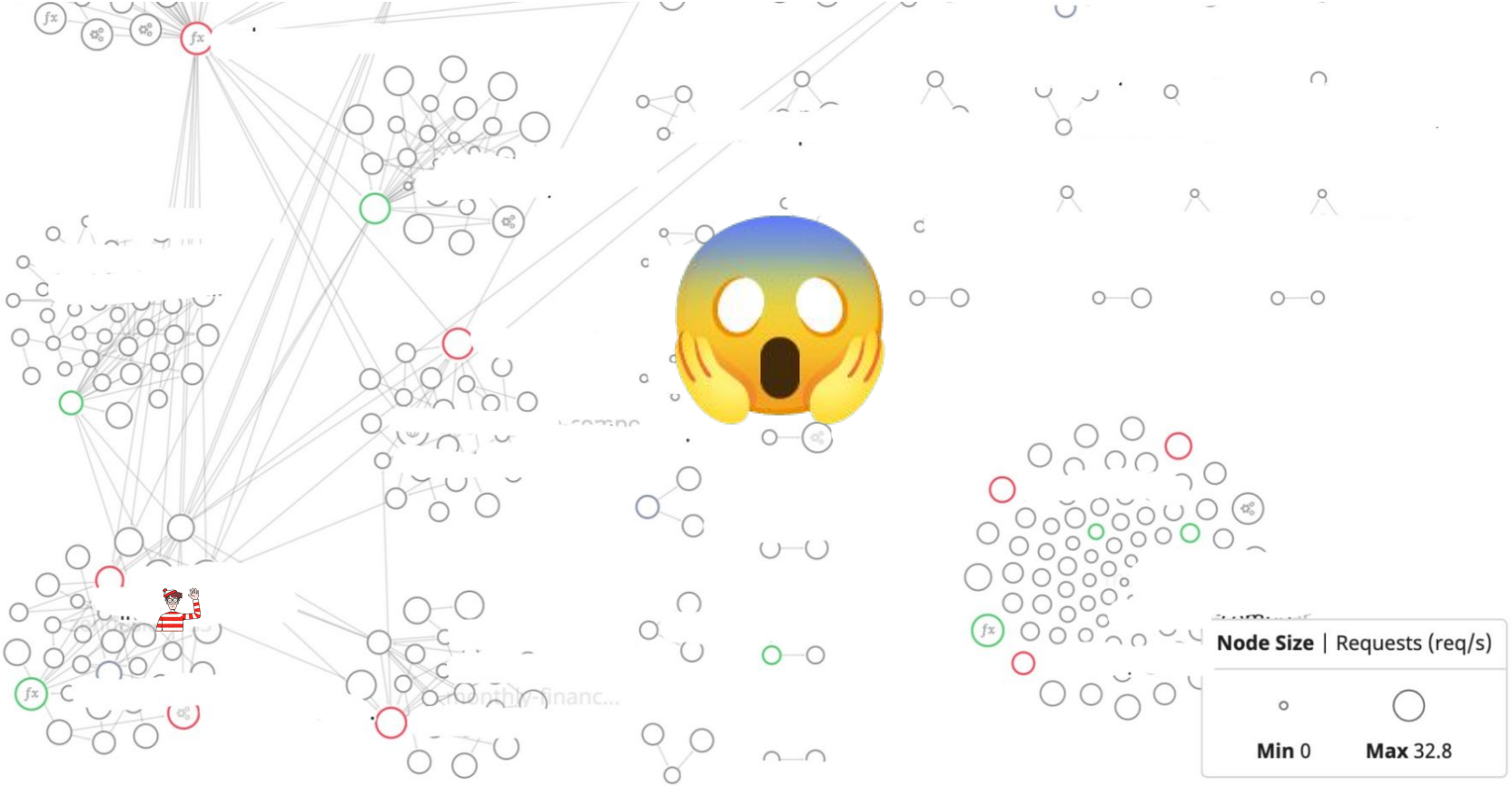
Build, ship, support



Revolution Model, *Emily Freeman*

SCAN ME

Systems are **complex**.


Node Size | Requests (req/s)
Min 0
Max 32.8

So, we need it.

We established a

culture of observability

at cinch.

It took us **3 years**.

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

1. Choose an observability tool

1. Choose an observability tool

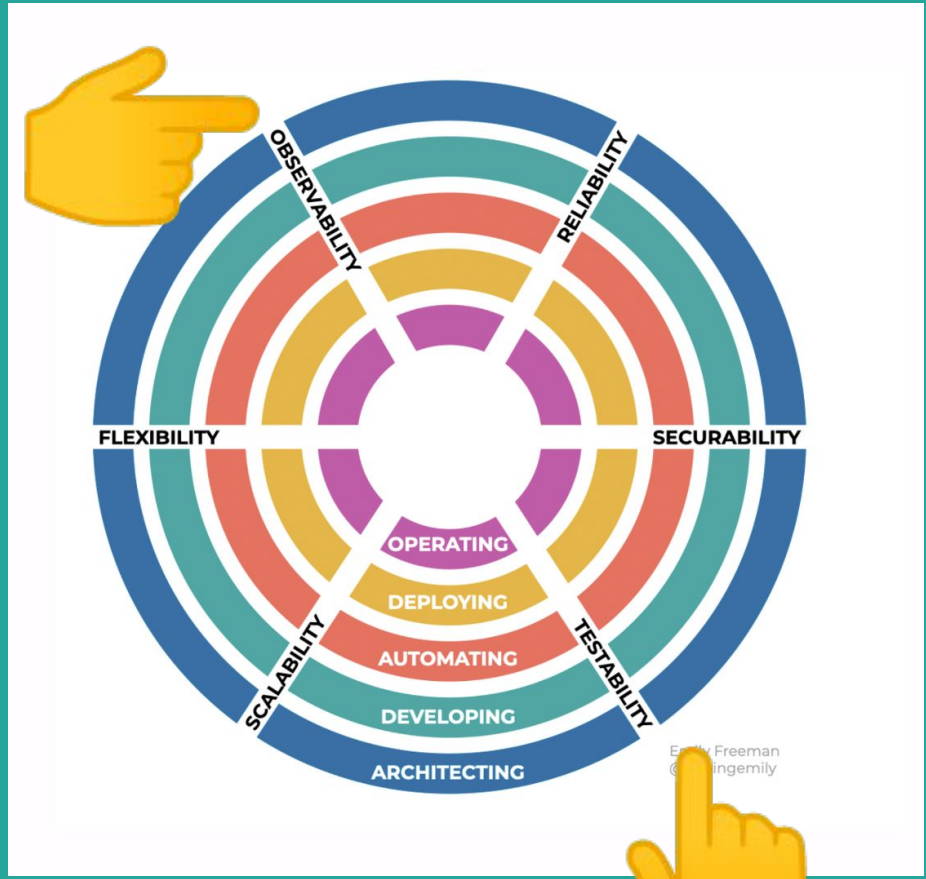
2. “Enable” telemetry data

1. Choose an observability tool
2. “Enable” telemetry data
3. Auto-generate the dashboard

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


MOVIECLIPS.com

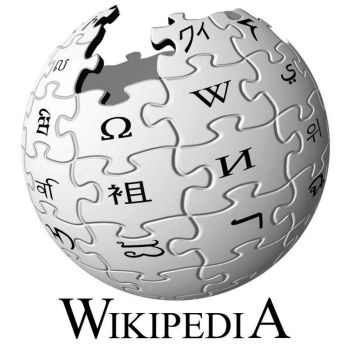
Observability
like
Testability



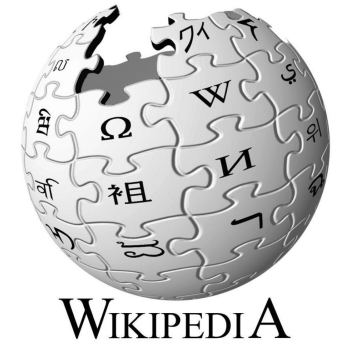
Observability is the **testability** of the 2020s, but

better.

…the degree to which a software artifact **supports testing** in a given test context.



If **testability** is high, then **finding faults** is **easier**.



Observability is **not as mainstream** as testability

Tests tell you what’s broken

Tests tell you what’s broken

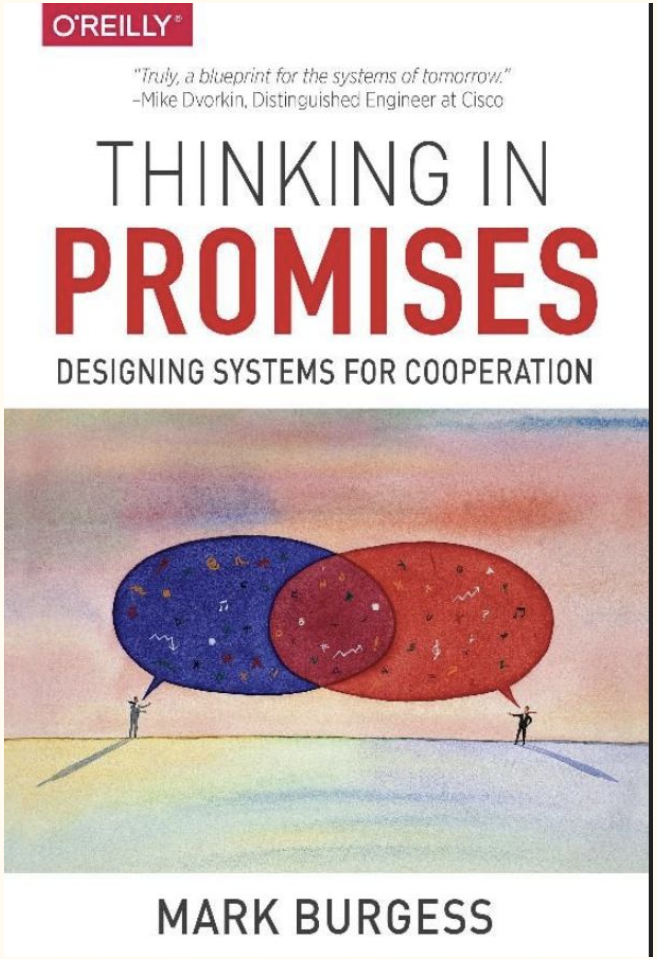
Observability tells you what’s happened

Observability > Testability

Testability 🧪

Observability 🌍

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

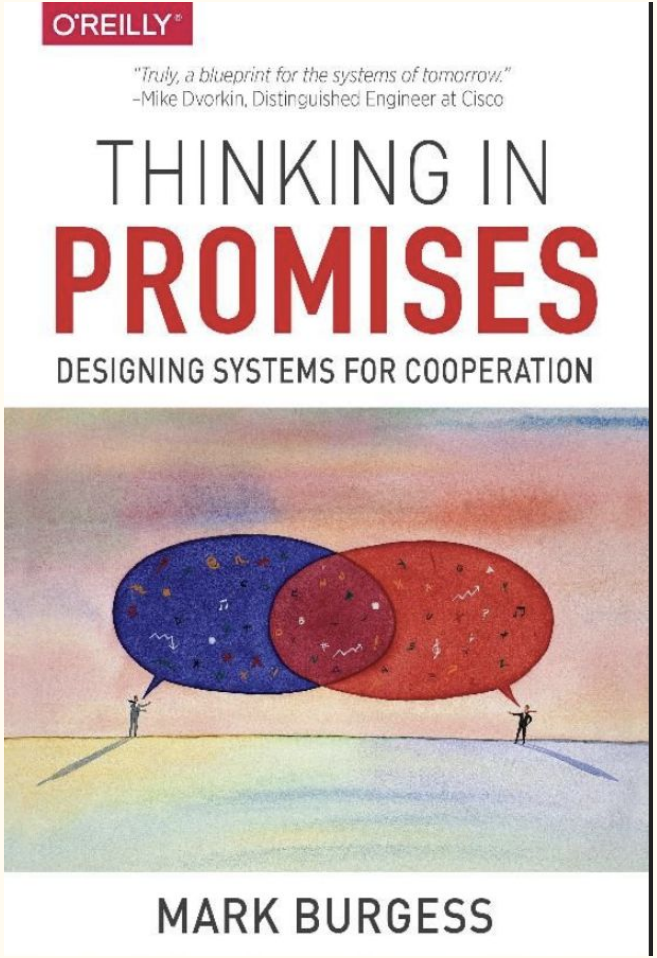


I **promise** that I will change the software, and it **won’t get worse**.

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

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

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



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.

2. Known Unknowns Things we are aware of and do not understand.	1. Known Knowns Things we are aware of and understand. t9y
4. Unknown Unknowns Things we aren't aware of and don't understand. o11y	3. Unknown Knowns Things we aren't aware of but understand.

Level of awareness

Level of understanding

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

Traditional

Next-gen

Serverless

“3 pillars”

“Everything is an event”

“Betting on serverless”

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?

⚒️ Pick o11y tool & let everyone have it

🎻 **Instrument code**

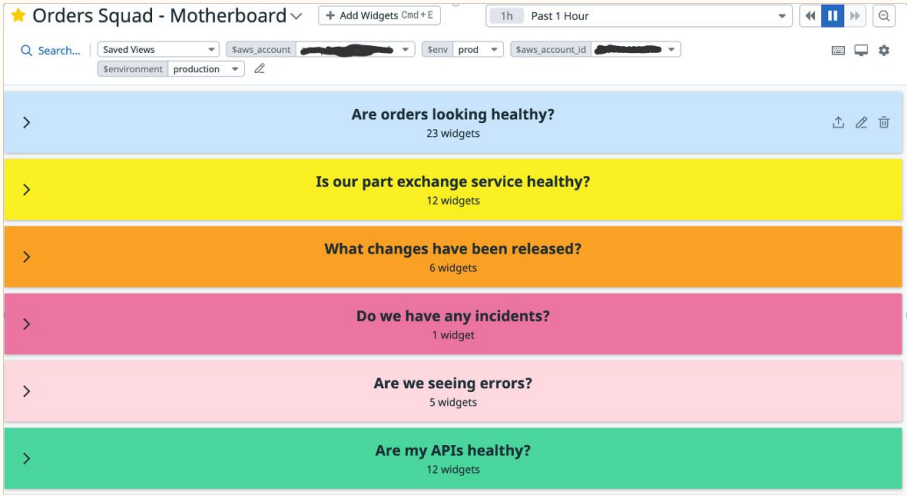
🧠 Support & enable learning

⚒️ Pick o11y tool & le

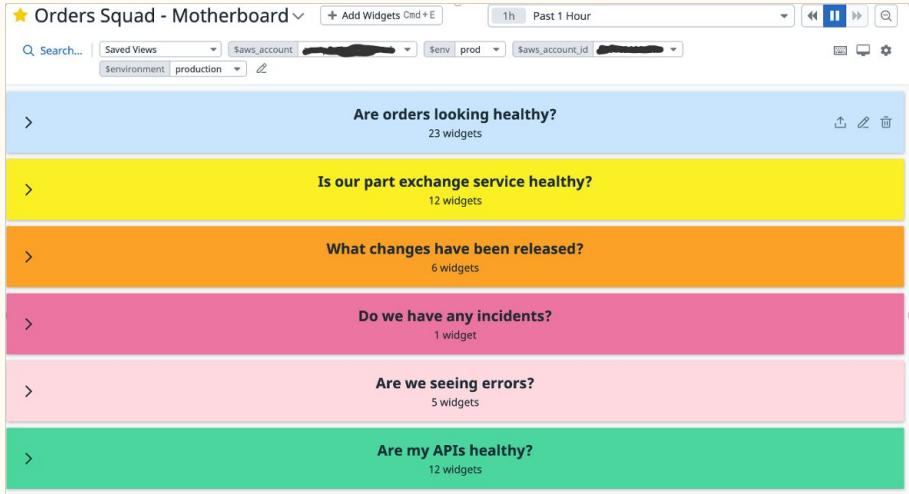
🎻 **Instrument code**

🧠 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)
    }
```



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)

2. Known Unknowns Things we are aware of and do not understand.	1. Known Knowns Things we are aware of and understand. Logs
4. Unknown Unknowns Things we aren't aware of and don't understand. Traces	3. Unknown Knowns Things we aren't aware of but understand.

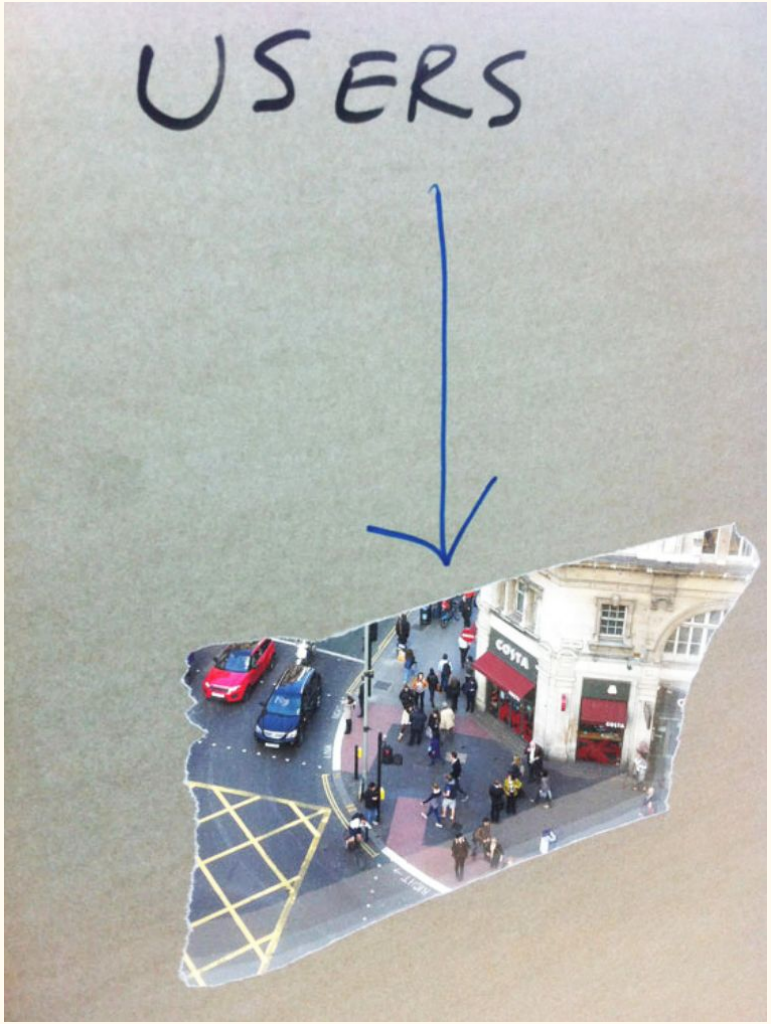
Level of awareness

Level of understanding

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)
    }
```



select * from **orderEvent**

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

You can ask
any question.

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.

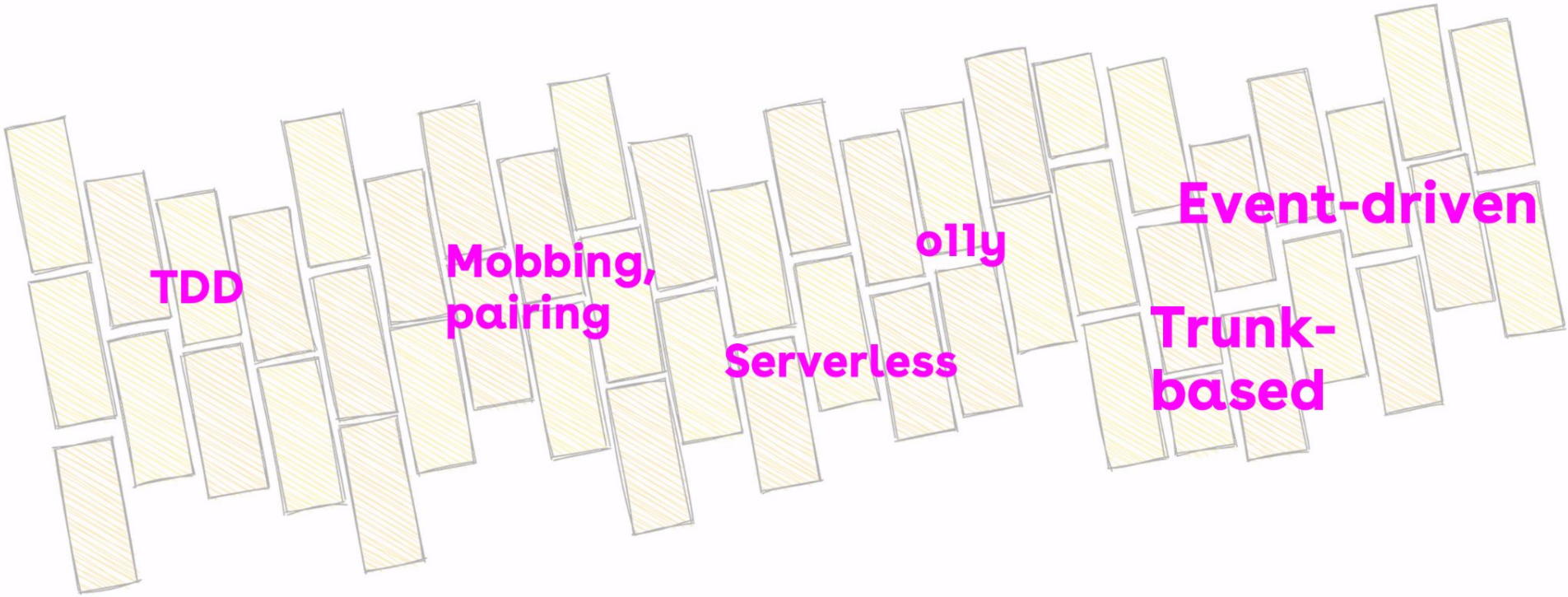
Adrian Cockcroft,
Hacking The Org podcast

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

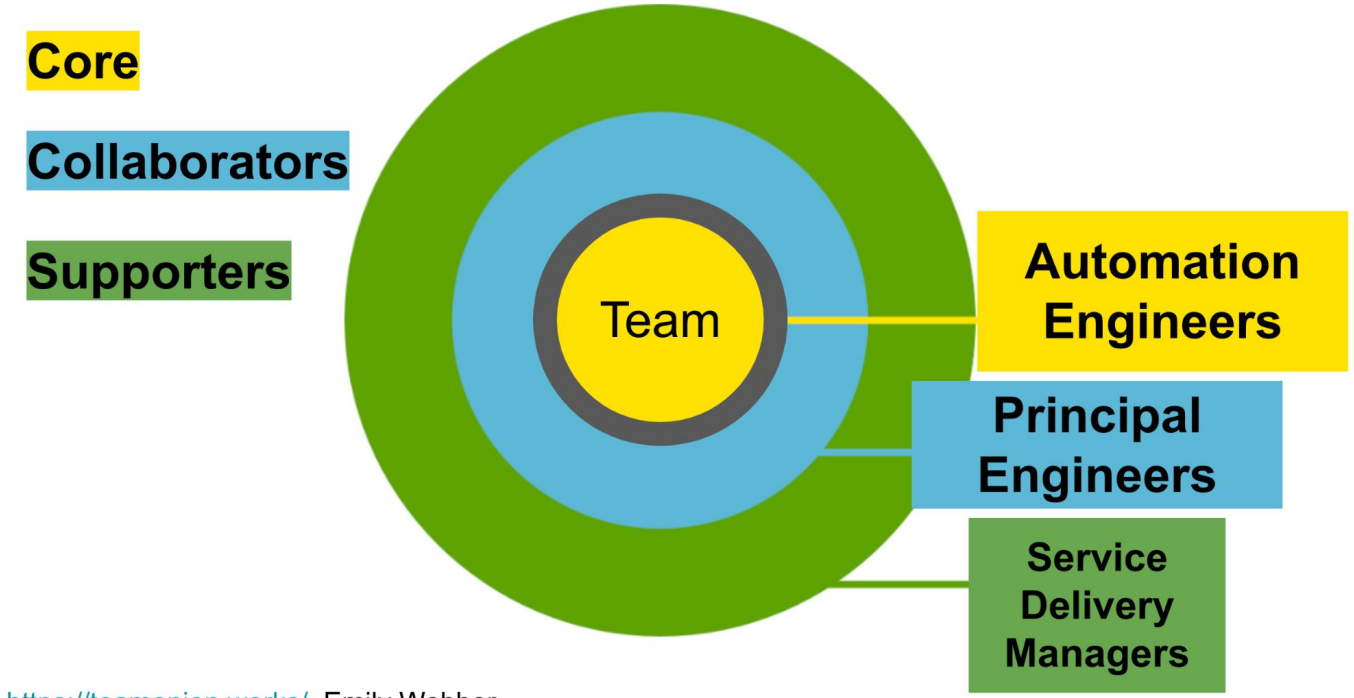
Support

Learn & Improve

Practice



🙏 Add o11y to your golden path



https://teamonion.works/, Emily Webber

🙏 Plant **enablers** into teams

🎓 **Community** of Interest

RUM Datadog Workshop ...

- Introduction 🎬
- Warm up - Personali...
- RUM 🐶
  - Quick Intro
  - UX Monitoring - Re...
- Instrumenting Cust...
  - Browsing the Docu...
  - Frontend Telemetry
- Feedback time ⏰

☆ RUM Datadog Workshop - LI

Created by **Sarika Antony**
Last updated 12 days ago

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:

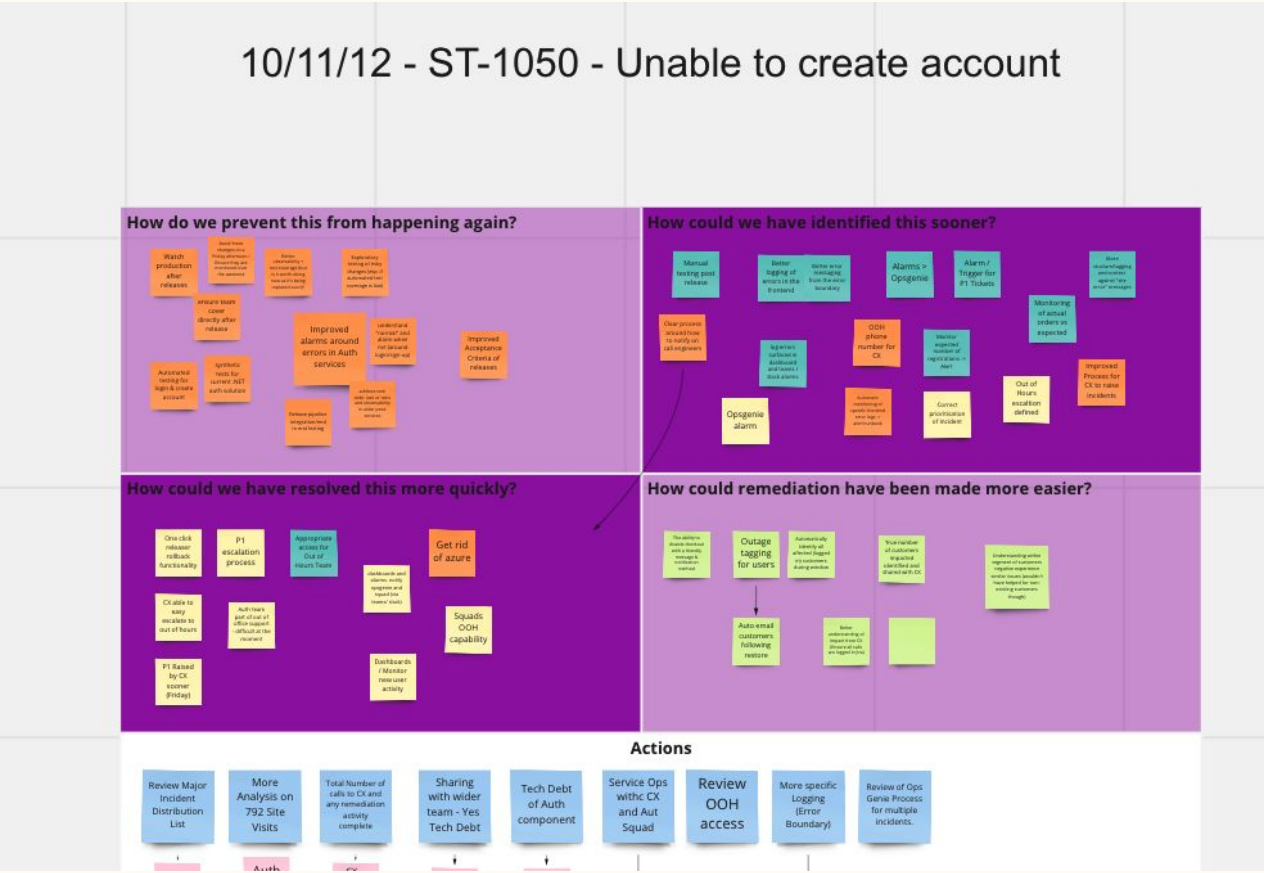
- DevOps Useful Resources
- Datadog Glossary reference
- Miro visual reference of products
- Miro visual reference of Data Sources
- Miro visual reference of Data Visualisation

🎓 O11y **workshops**

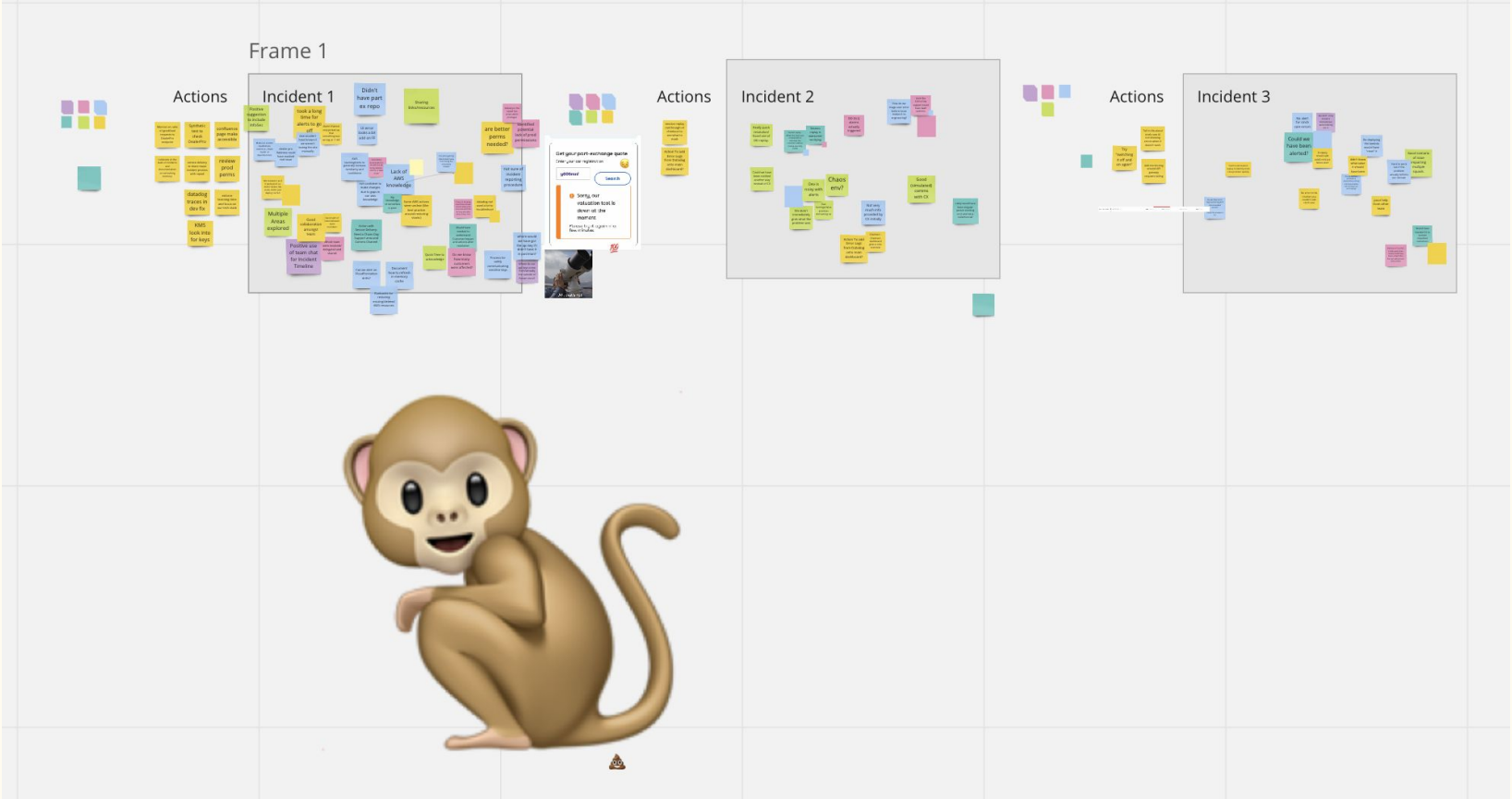
Dr. Ron Westrum's 'Three Cultures Model'

PATHOLOGICAL	BUREAUCRATIC	GENERATIVE
Power-oriented	Rule-oriented	Performance-oriented
Low cooperation	Modest cooperation	High cooperation
Messengers shot	Messengers neglected	Messengers trained
Responsibilites shirked	Narrow responsibilites	Risks are shared
Bridging discouraged	Bridging tolerated	Bridging encouraged
Failure = scapegoating	Failure = justice	Failure = inquiry
Novelty crushed	Novelty = problems	Novelty implemented

🎓 Psychological **safety**



🎓 Incident reviews



🤾‍♀️ 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

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

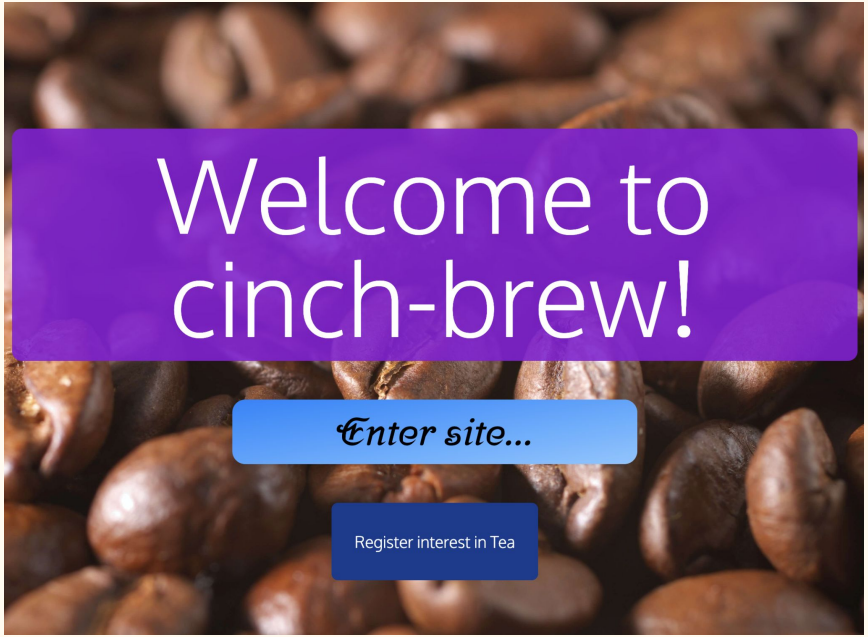
cinch-brew

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

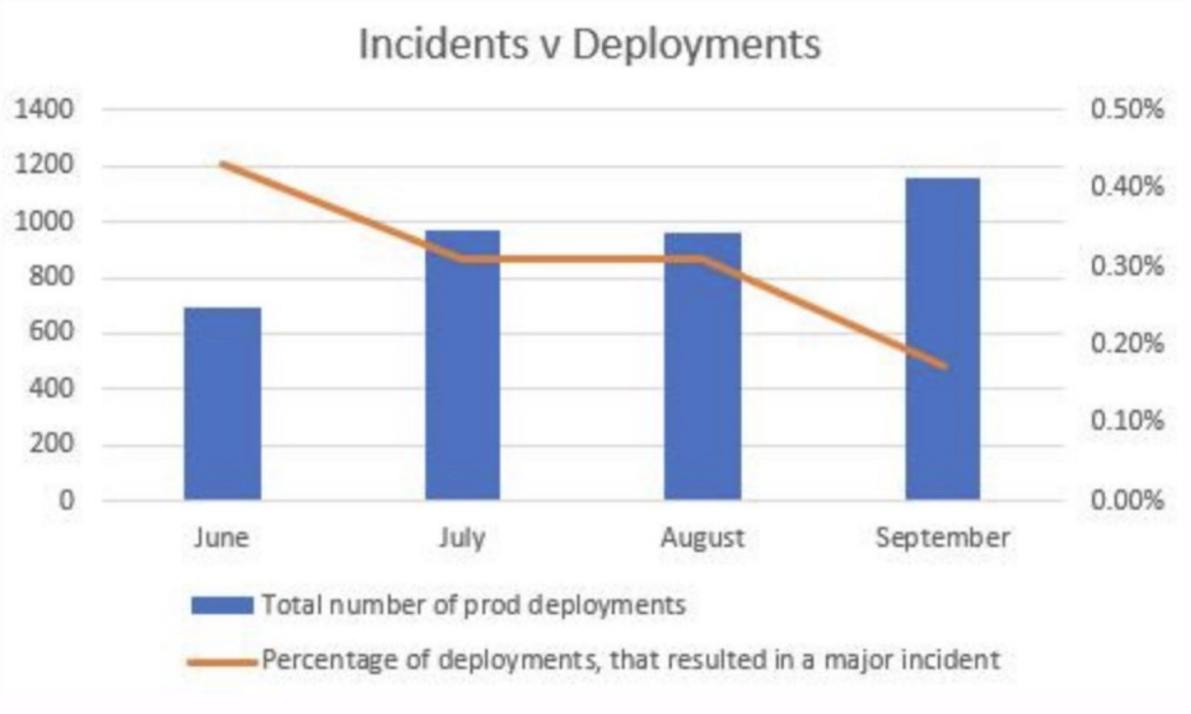
Org: all teams practice ODD*

***Observability Driven Development**

So **what**?

Observability is **expensive**.

Incidents are **rare**.



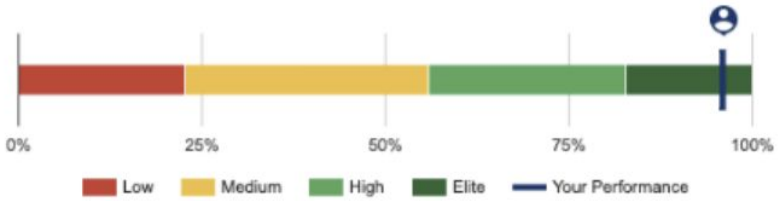
Mean time to recovery
is not an issue.

Your software delivery performance

Your performance:

Elite

You're performing better than 96% of State of DevOps Survey respondents.



cinch

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

But this will **not** happen overnight.

Year 1

Instrument their code by default

Take ownership of their **alarms**

Have a good view of **business transactions**

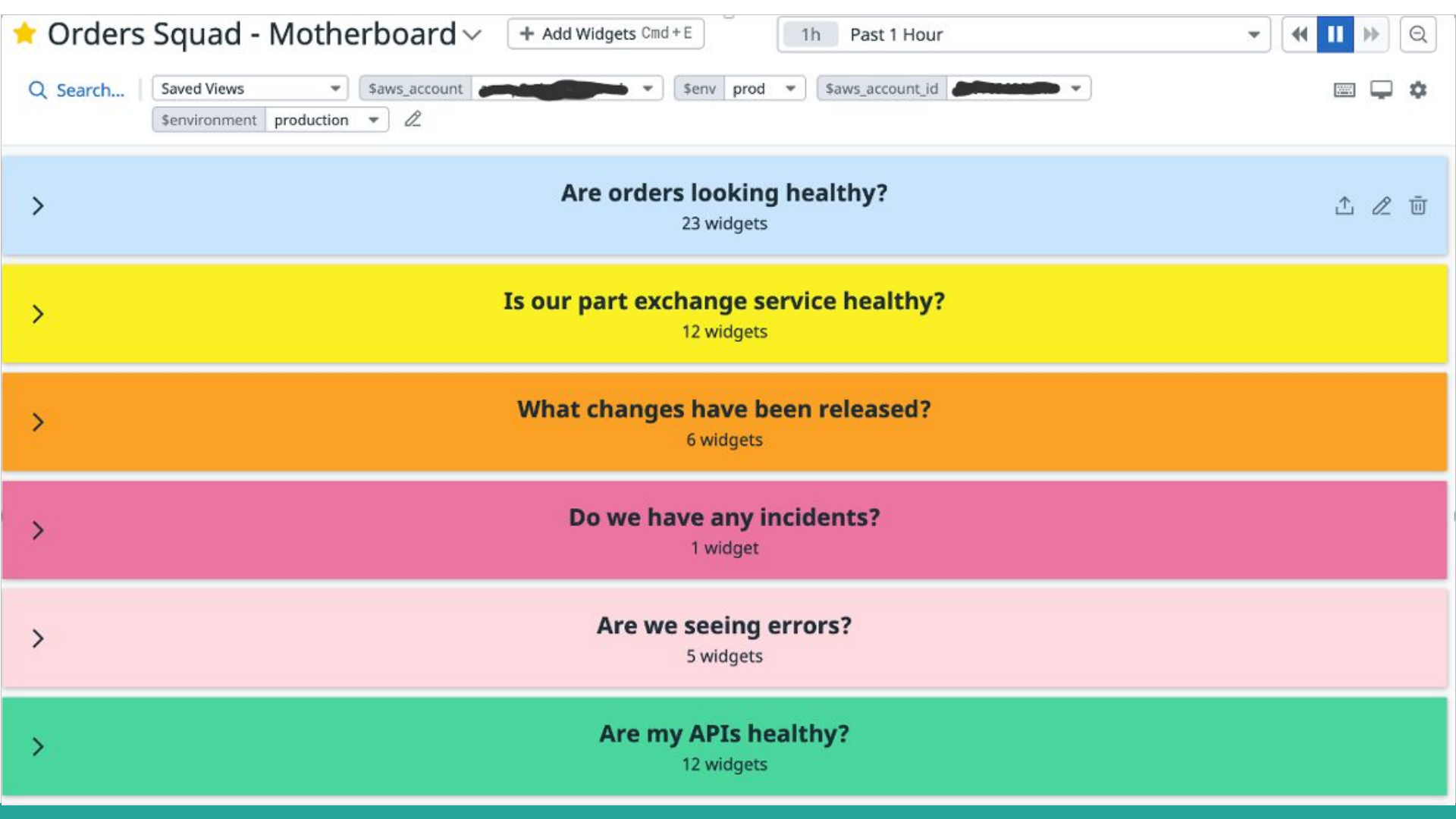
Year 1

Own and evolve dashboards

Review dashboards during **stand-ups**

Review dashboards at the **end of the day**

Year 1


Orders Squad - Motherboard
+ Add Widgets Cmd + E
1h Past 1 Hour
Search...
Saved Views
$aws_account [redacted]
$env prod
$aws_account_id [redacted]
$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

Have a **rhythm of** o11y **improvement** katas

Improve o11y via **incident review feedback**

Enable **non-tech roles** to use dashboards

Year 1

Year 2

Traces are used as the telemetry unit

Logs are used in the context of traces

Using **RUM** linked to back-end **traces**

Year 2

Other parts of the system are instrumented

Teams start creating and owning **SLOs**

An **o11y community** starts to emerge

Year 2

Year 3

o11y blueprints emerge

Self-sustaining o11y Community flourishes

Subject matter experts in o11y grow

Year 3

Engineers are **skilled o11y practitioners**

Non-techies know about o11y

All teams consider **o11y as a given**

Year 3

How is o11y **democratised**?

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

***of our software systems are across the org**

o11y

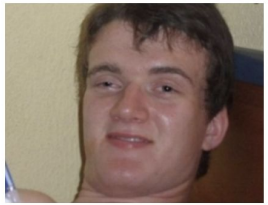
Business Analytics & Data Intelligence

Observability is **blurring** the lines.

Is o11y a **dev** thing?

BA friendly intro to Observability

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?"

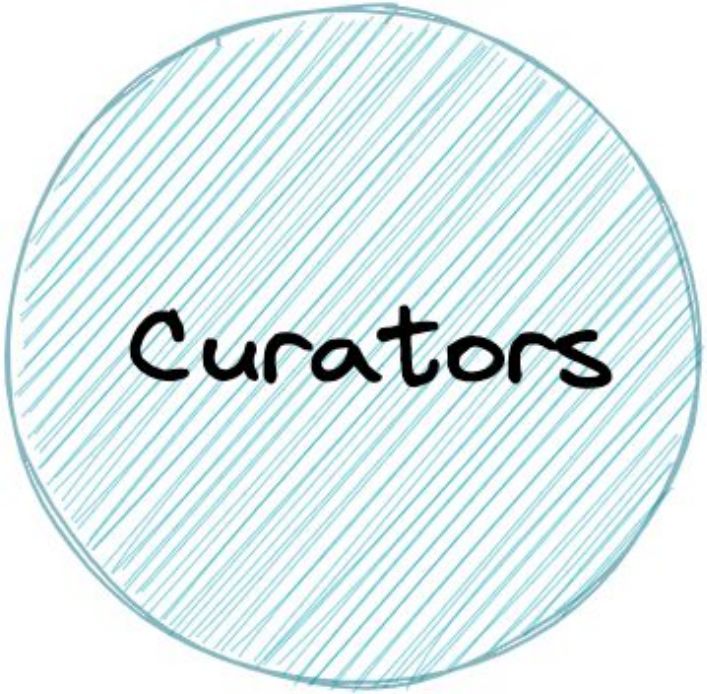
The "leave house" lambda was invoked last night at 8:30 pm

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

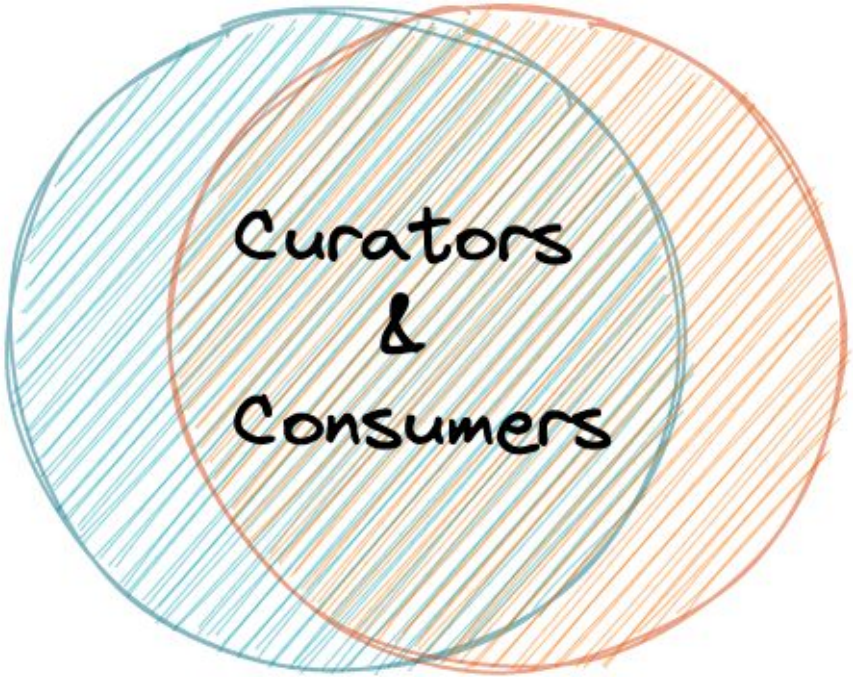
The "Mojo" lambda was triggered at 1am. The alert for Jagerbombs went off at 1:05am.

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 and they **support** it.

Multiple Cards

Multiple Cards Selection	Users selecting multiple cards
16.12%	208

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

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

Single Card

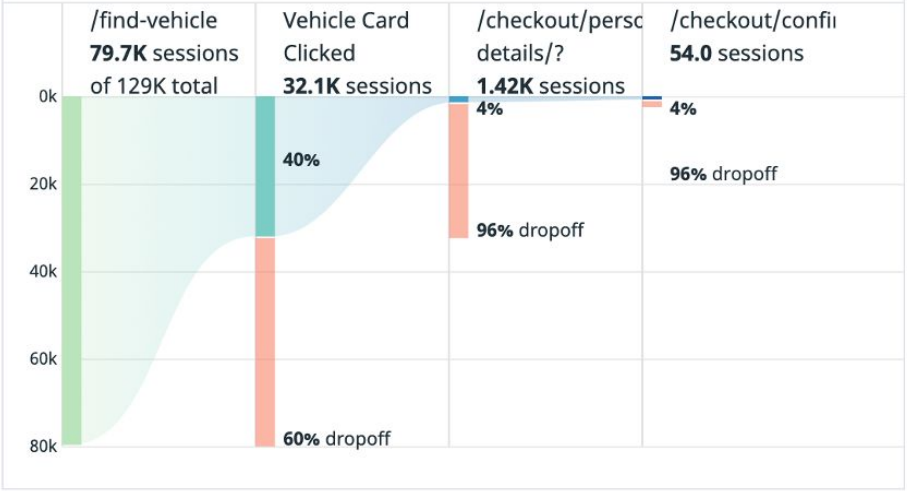
Single Card Selection	Users selecting single card
83.88%	1.08k

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

7.87k	Fiesta
7.32k	Golf
6.49k	A-Class
6.00k	Focus
5.23k	A3
4.83k	1 Series
4.11k	3 Series
3.98k	A1

Search devices

45.33k	Mobile
19.21k	Desktop
3.65k	Tablet
51.00	Bot
3.00	Appliance

Make Searches

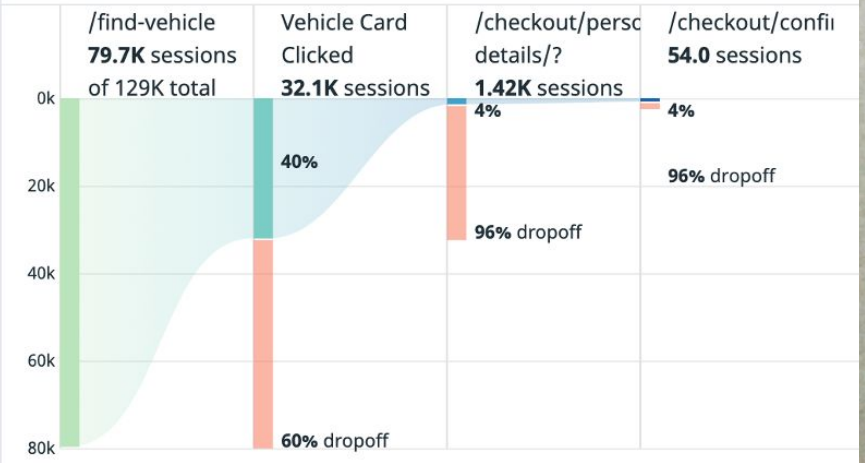
33.88k	BMW
27.16k	Ford
25.99k	Audi
25.43k	Mercedes-Benz
22.70k	Volkswagen
12.08k	Land Rover
11.57k	KIA
11.57k	Vauxhall

Search Browsers

22.61k	Mobile Safari
16.30k	Chrome Mobile
10.28k	Chrome
4.66k	Safari
3.97k	Samsung Internet
3.91k	Edge
3.41k	Google
2.03k	Chrome Mobile iOS

Traffi

Funnel Conversion



Wrapping up

Lack of o11y is our
collective tech debt.

We’re now fixing it.

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

20+ teams **practicing observability**

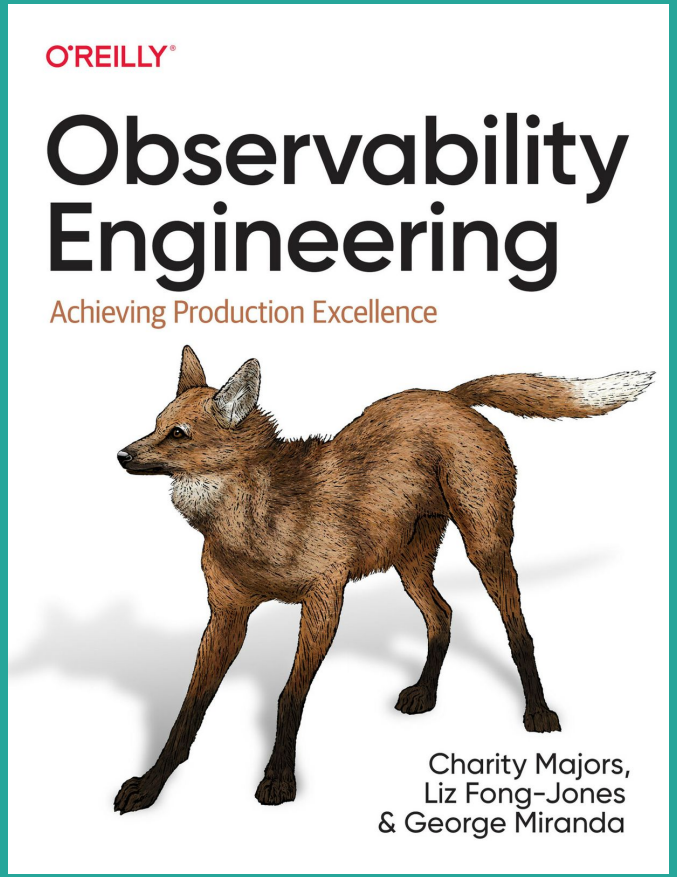
Observability > Testability

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

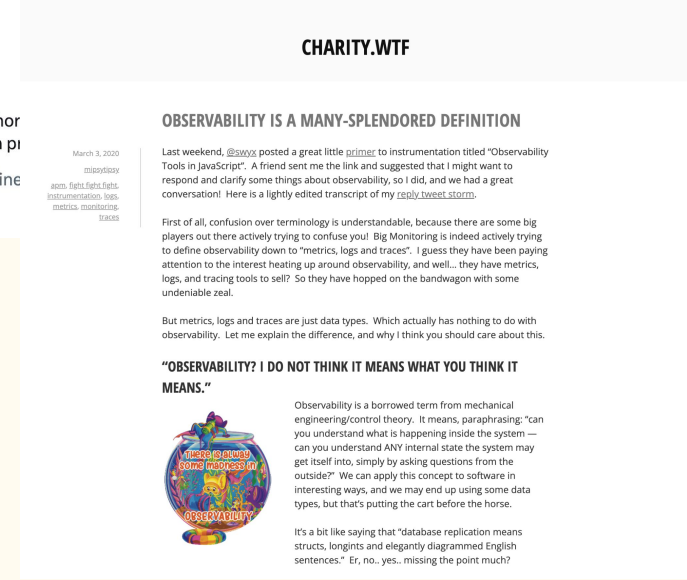
 **Instrument** code

 Support & enable **learning**

Read this book




Charity Majors
59.3K Tweets
FRIDAY DEPLOYS?
NO SWEAT
Following
Charity Majors
@mipsytipsy
cofounder/CTO @honeycombio, co-author
Database Reliability Engineering. I test in pı
San Francisco
charity.wtf
Joine
529 Following
77.8K Followers


CHARITY.WTF
OBSERVABILITY IS A MANY-SPLENDORED DEFINITION
March 3, 2020
mipsytipsy
apm, fight fight fight, instrumentation, logs, metrics, monitoring, traces
Last weekend, @swyx 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."
There is always some madness in
OBSERVABILITY
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

There is **no singular and correct order or prescriptive way** of doing these things...

Charity Majors, Liz Fong-Jones, George Miranda.

Observability Engineering

…at each step, **focus on what you're hoping to achieve**.

Charity Majors, Liz Fong-Jones, George Miranda.

Observability Engineering

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

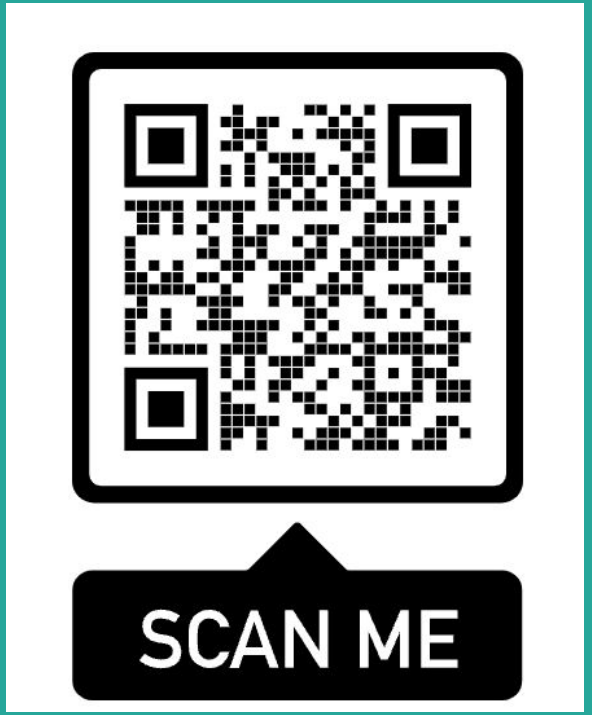
You will **amplify** and **democratise** the **understanding** of the **behaviour** of your software system

Thank you 🙏

SCAN ME

@apostolis09

Questions?



@apostolis09