HI!

(Tooling Our Way Out of)
The Cosmos Technical Debt Crisis

(or, How I Learned to Stop Worrying and Love teh Agile)

What do we mean by "tool"?

> That which enables us to achieve more than we could unaided

> "We shape our tools, and thereafter they shape us".
> — McLuhan

Strangelove loves to make tools

- `Spawn`
- `Interchaintest`
- `Cosmos Operator`
- `Heighliner`
- etc.

By their nature

Decentralized Systems Are Robust And Resilient (our Natural Advantage)

but

The Cost is a Heavy Coordination Load (our Natural Weakness)

Do any of these sound familiar?

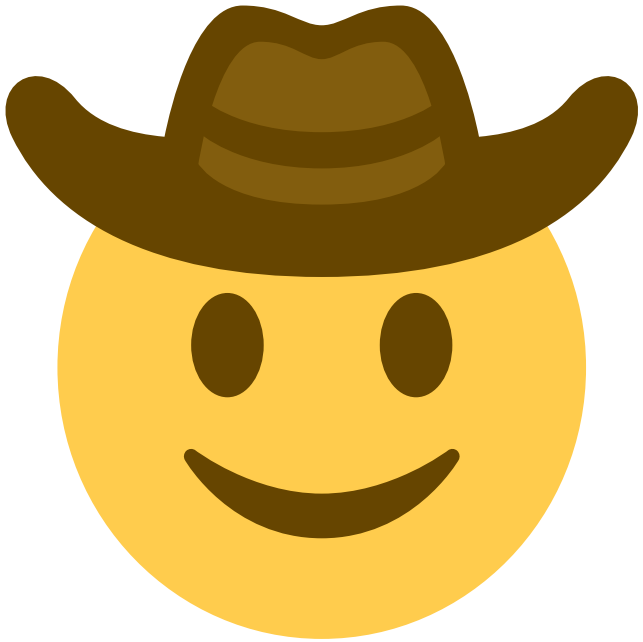
- 🤮 "self-eating dependency graph"
- 🤮 forks & cost upstream maintenance
- 🤮 direct correlation bw size of project and how bespoke it's become?
- 🤮 timelines are slow and unpredictable; cycle time is a killer
- 🤮 requirements aren't ACTUALLY what the user needs
- 🤮 (or are obsolete by the time they get to market)

The good news

- THESE ARE SOLVED PROBLEMS
- software development has 20+ years dealing with this
- ...we just need to look past the dross of the Agile Industrial Complex and get past bad experiences

Why listen to me?

- Web 2 {design, engineering, product}
- blockchain found me
- How I got here



The Plan

0. The Backstory
1. The Stakes
2. The Way Out
3. The Nitty-Gritties
4. The Recap

0. The Backstory

Previously, on *The 20th Century*

- WWII leaves USA as the only major intact industrial base
- 1960s: Japan is making terrible cars
- 1980s: Japan is making incredible cars
- Why? "Lean Manufacturing" i.e., *the Toyota Production System*

Describe *Lean* while standing on one foot:

"Minimize Waste"

🗑️	Muda (無駄)	"Waste"
🎢	Mura (斑)	"Unevenness"
🏋️	Muri (無理)	"Overburden"

Lean Manufacturing identifies 7 forms of Waste:

1. waste of *Inventory*
2. waste of *Over-Production*
3. waste of *Extra Processing*
4. waste of *Transportation*
5. waste of *Waiting*
6. waste of *Motion*
7. waste of *Defects*

~20 years later

Lean Software Development: An Agile Toolkit by Mary & Tom Poppendieck

Manufacturing Waste of...	Maps to Software waste as...
Inventory	🧩 Partially Done Work (or Work In Process)
Over Production	🤦 Delivering Extra or Unneeded Features
Extra Processing	🔁 Relearning
Transportation	🤦 Handoffs
Waiting	⏳ Delays
Motion	🌪️ Context Switching
Defects	🐞 Defects

Any of this sounding familiar?

I. The Stakes

The Appchain thesis is better

The Appchain thesis is losing

BUT! If we get this right

IT'S A COMPETITIVE ADVANTAGE

(versus the rest of Web 3)

What does failure look like?

- ETH / SOL / L2s press their TVL / penetration gains
- They catch up w/ our PoS-in-production lead
- crypto becomes another Inferior Tech Wins story,
  (e.g. *VHS-vs-Beta* or *Qwerty-vs-Dvorak*)

What does success look like?

- ETH / rollup thesis has peaked
- significant incumbent investment in Appchains
- clear path to appchain-TVL-surpasses-rollup-TVL

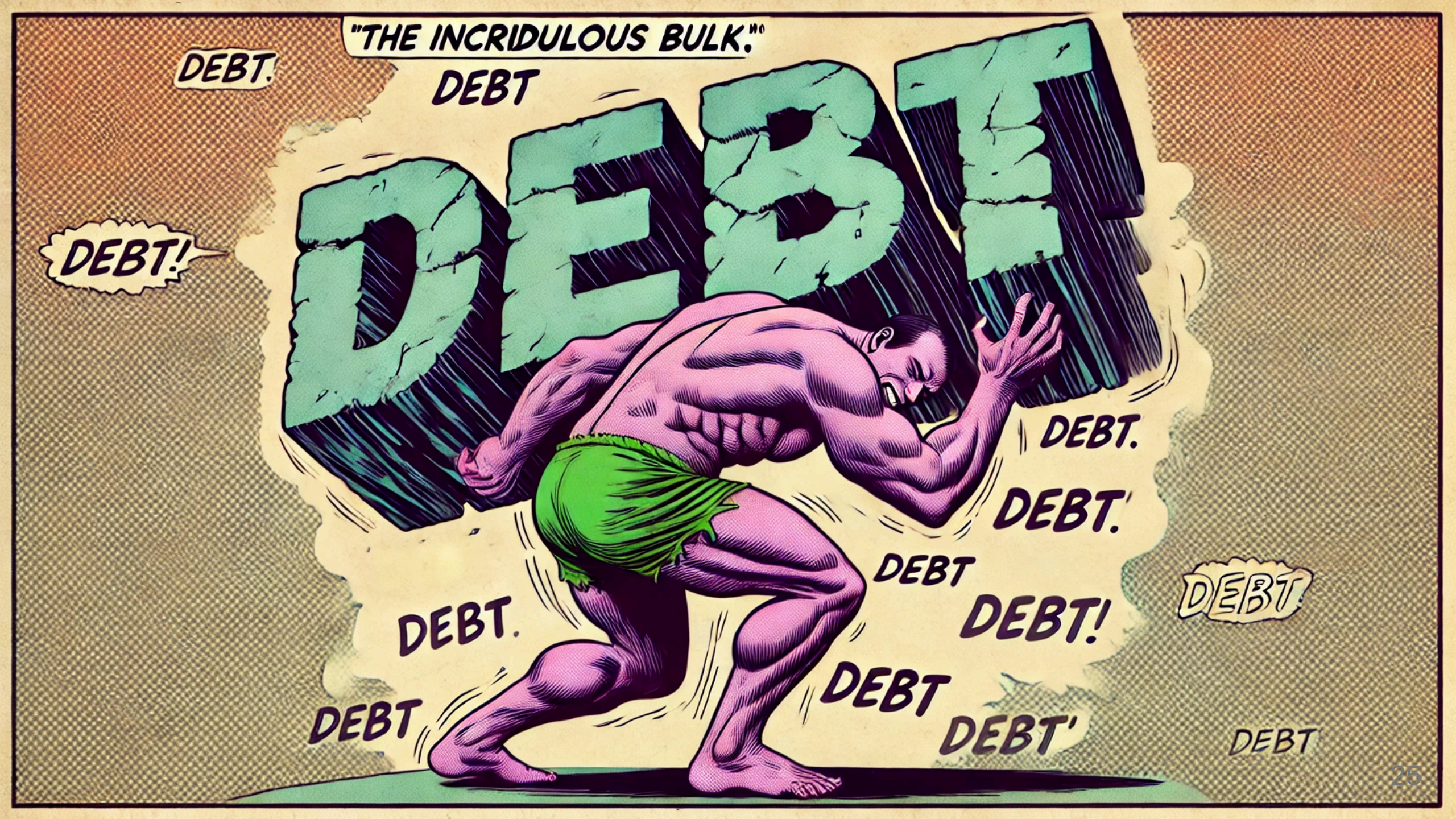
Why are we at risk?

- Unreliable Delivery
- Unsustainable Builds
- Poor Lotto Count
- High Cost Of Change

Do Cosmos Pains map to Lean waste?

🤮 "self-eating dependency graph"	🤦🔁🐞
🤮 forks & cost upstream maintenance	🤦🤦🌪️
🤮 direct correlation bw size of project and how bespoke it's become?	🤦🐞
🤮 timelines are slow and unpredictable; cycle time is a killer	🧩⏳
🤮 requirements aren't ACTUALLY what the user needs	🤦🤦
🤮 (or are obsolete by the time they get to market)	⏳

What's missing from this description of "waste"?


"THE INCRIDULOUS BULK."
DEBT.
DEBT
DEBT
DEBT!
DEBT.
DEBT.
DEBT
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DEBT

🗑️ Waste != "Debt"
(though we often conflate the two)

Tech Debt != 💩 Bad Code 💩

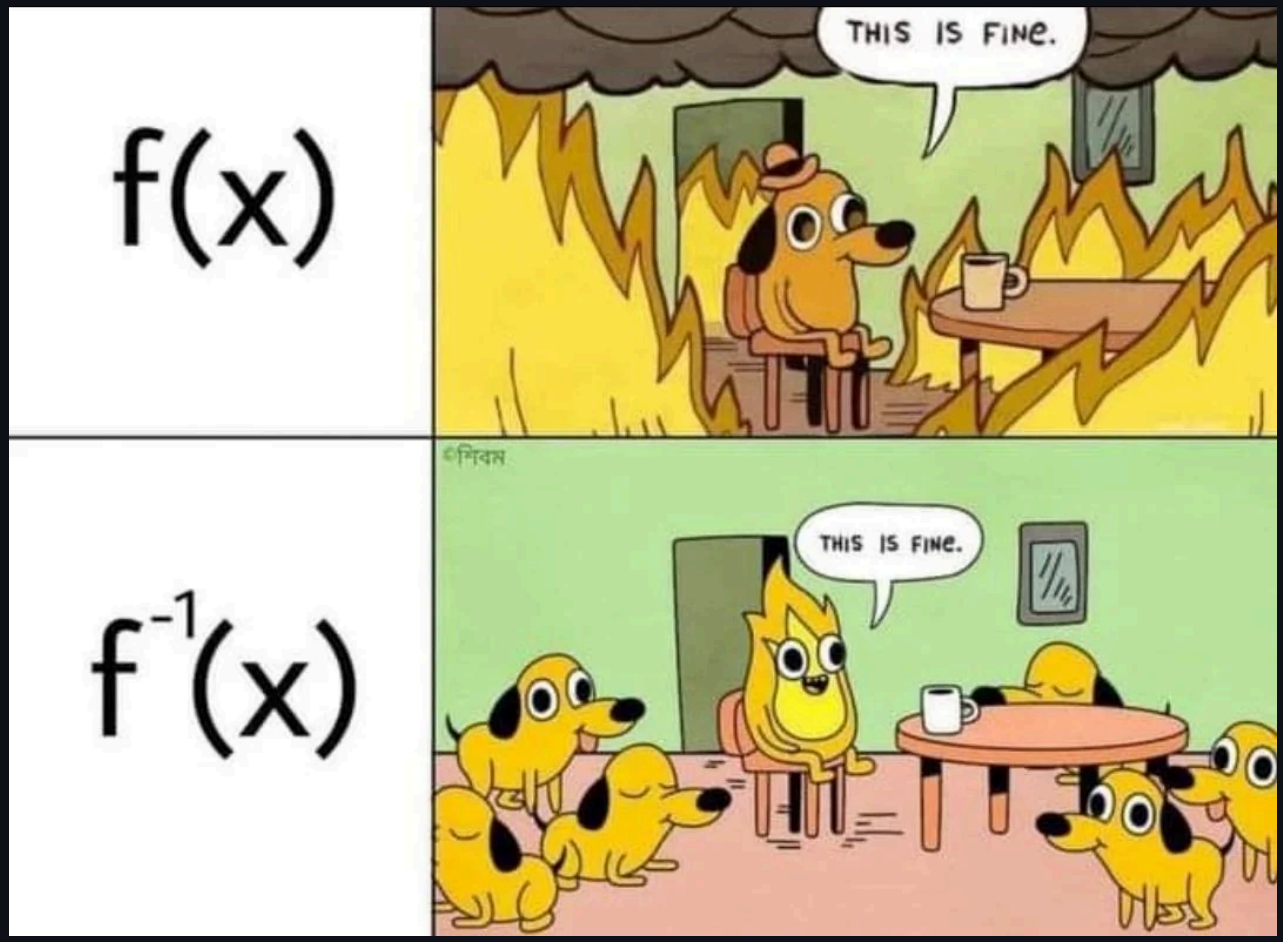
Tech Debt == the freedom to choose *when* to spend work effort optimizing code

In software development, 😡 *Premature Optimization* 😡 is the mind killer

HMW escape this {debt, waste} trap?

II. The Way Out

What if we stopped forgetting what worked well last time?



What might translate from Web 2..3?

	Lean software Muda	Web 2 (XP) remedy	Works for Web 3?
🧩	*Partially Done Work (WIP)*	WIP Limits	✅
🤦	*Delivering Unneeded Features*	Validating Assumptions	✅
🔁	*Relearning*	strong Lotto Count, pair-programming, CoC	✅
🤷	*Handoffs*	autonomuous, x-fct'l teams	❓ Is w3 too specialized for x-fct'l?

Atoms vs. Bits

The Old Way

optimize for predictable timelines.

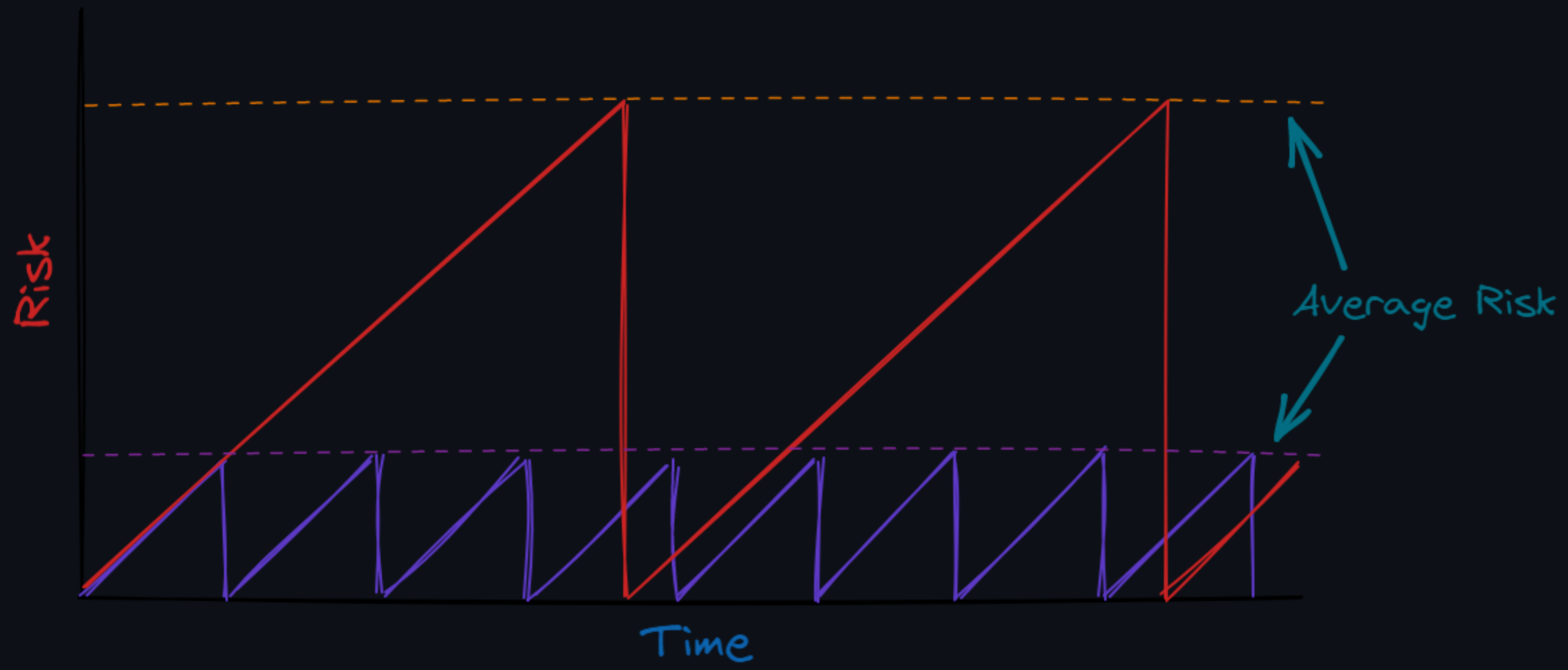
The Right Way

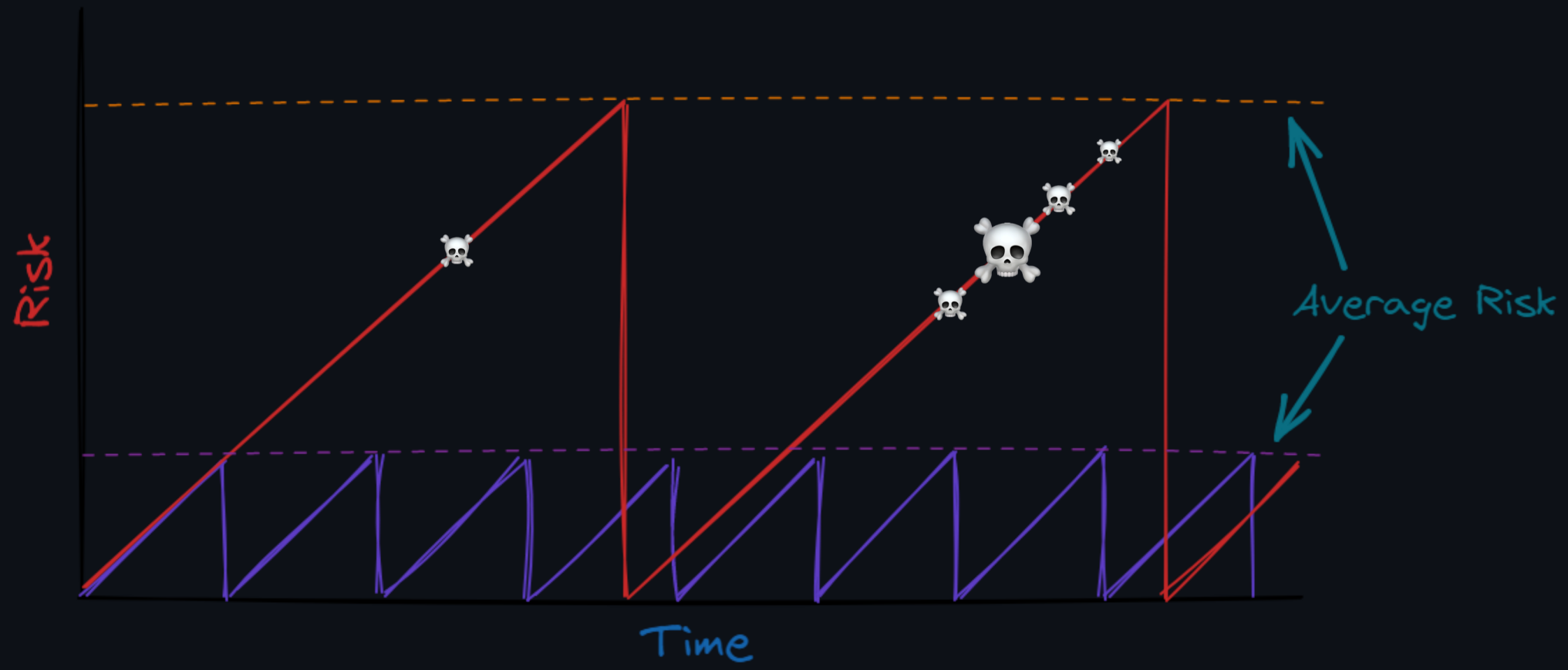
optimize for low cost-of-change.

The "Standing on one foot" version:

Optimize for Short Feedback Loops

(...all the rest is commentary...)


Risk
Average Risk
Time


Risk
Average Risk
Time

Fear leads to Anger

Anger leads to Hate

Hate leads to Suffering

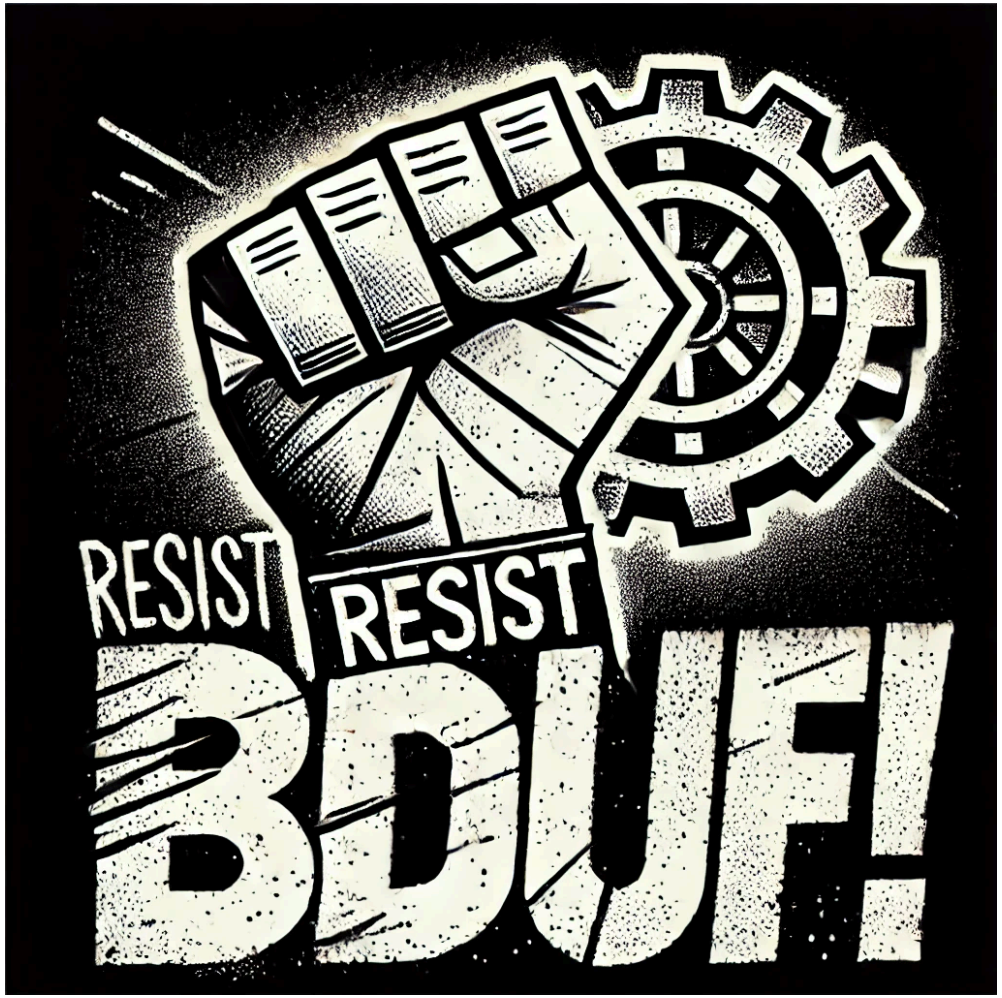
Continuous Iterative Development

Why?

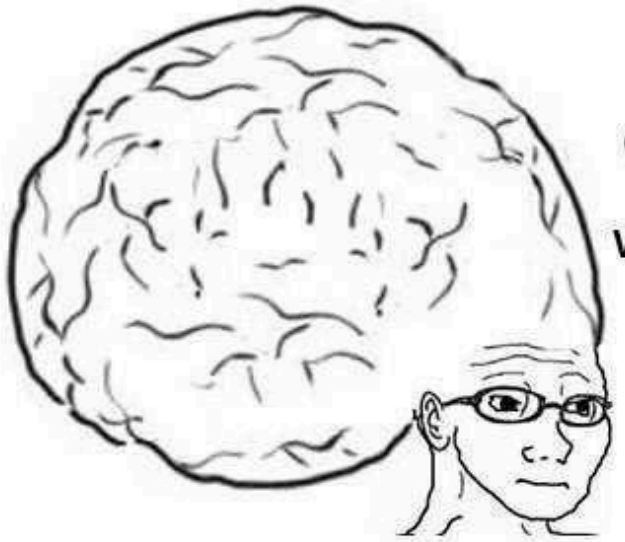
- Premature Optimization is the Mind Killer
- Learning Requires Mistakes

How?

- Optimize for **Small Feedback Loops**
- By default, *Show Your Work*
- Fidelity Of Planning Must Be Appropriate ("Flag Down The Beach")
- Resist BDUF ("Big Design Up Front")



Agile then



"Let's get a customer to sit with the team while we iterate on a solution"

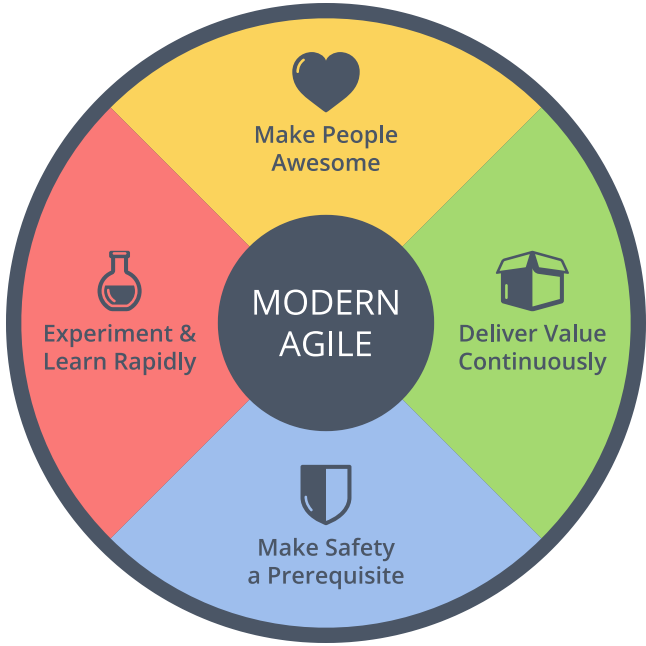
Agile now

"Your card is in the wrong Jira template"

🚨 SPOILER ALERT 🚨

"Agile" is the old word for "Decentralization"

Original Manifesto (2001)		Modern Agile (2016)
Individuals and interactions over processes and tools	→	Make People Awesome
Working software over comprehensive documentation	→	Deliver Value Continuously
Customer collaboration over contract negotiation	→	Make Safety a Prerequisite
Responding to change over following a plan	→	Experiment & Learn Rapidly



Hypothesis:

- I (we?) believe **Web 3 engineering culture**
- **Burns tons of energy re-inventing wheels**,
  and chronically suffers from problems which have known solutions.
- We can fix this by **revisiting those Wheels and Solutions**
  (which are feasible and cheap to implement), and
- We'll know we're right if we see **positive (qualitative) feedback, improved (quantitative) cycle times, and healthier code**
  (as measured by static analysis, defect rates, etc. etc.)

So how exactly does this work?

III. The Nitty-Gritties

🏋️ Doing more work than we need to

Minimize energy spent making trivial choices

Convention over Configuration

- Always reserve the ability to configure based on local conditions, but otherwise
- Agree on conventions for the 80% of every project which is boilerplate

🤦 Unclear Definition of "Done" at the ~Epic level

A shared, falsifiable understanding of "MVP"

Lean Hypotheses

```
We believe [TYPE OF USER]
has a problem [DOING THING].
We can help them with [OUR SOLUTION].
We'll know we're right if [CHANGE IN METRIC].
```

🤦 Unclear Definition of "Done" at a Story level

Cheap, simple confidence in shared expectations

Well-Formed Stories

1. Describe *Acceptance Criteria in Gherkin* ("Given", "When", "Then", "And")
2. Describe *motivation* using `As a...` / `I want to...` / `Because...`
3. Story titles ought to include the word *"should"*

🔁 No sane defaults for team communications

{Minimal, necessary, sufficient} expectations for team communications

{FUTURE, PRESENT, PAST, CADENCE}.
Every team ought to agree on the *Canonical Source Of Truth* for:

FUTURE plans	Where do we keep them?	Usually a backlog. GH Projects? Jira? A legal contract?
Conversations in the PRESENT	How do we have them?	Slack? TG? Respond to emails that same day?
Work that's been done in the PAST	What does it look like?	Code repos? gDocs? ADRs?

🏋️ Not enough time for real work

confine planning overhead to 7.5% of yr week. The other 37 hrs are for coding.

A Responsible Recipe for Fewest Possible Meetings

- 50m weekly: Daily Standup (5x weekly, 10m each)
- 60m weekly: Iteration Planning Meeting ("IPM), 1x weekly, 60m each
- 60m weekly: Friday Afternoon Mtg (rotate bw Team Retro, Tech Retro, and Release Planning)

That's it. ~3hrs/wk for builders to keep teams and comms healthy.

🏋️ Too many meetings

A shared, actionable, falsifiable rubric for "this mtg could have been an email".

💀 MEMENTO MORI MEETING TYPES

Meeting	Outcome	example
DELIBERATION	Decisions	whiteboard a feature, prioritize a backlog
BONDING	Relationships / bonds	karaoke
BIG NEWS	knowledge is disseminated	"We've exited!" or "${PERSON} is leaving".
DO NOT CALL A		

📈 Understanding the status of work

{Minimal, necessary, sufficient} vocabulary to talk about work being "done".

Conventional story types

Status	How do we know?
🌨️ Icebox	**Unprioritized** but worth doing.
📋 Backlog	Prioritized **unstarted** work.
🤸 In Progress	**Active**ly being worked on.
👀 Waiting / In review	**Depends** on something we don't control.
🥳 Done	**No more effort** is required.

🗑️ Which work ought we prioritize?

Optimize for "progress is the primary measured in working software"

Conventional story states

⭐ User story	Least amount of work w/ User-facing value
🐞 Bug	Regression (*not* new requirements)
⚙️ Chore	Anything w/o user-facing value
👑 Epic	Anything bigger than a story
🏁 Release Marker	Anything w/ a fixed time (scope or cost *MUST* float)

MORE TOOLS :

1. `Software Craftsmanship`
2. `Y.A.G.N.I.`
3. `Continuous Delivery => FEEDBACK LOOPS`
4. `The Right Kind of Laziness`
5. `Focus on Business Value`
6. `Ubiquitous Language (Eric Evans)`

`Happen`, `Continuous Incremental Delivery`, `Convention Over Configuration`, `Definition of "Done"`, `Deliver Value Continuously`, `Enablement && Execution`, `Escaping the Build Trap`, `Experiment & Learn Rapidly`, `Experiment Backlog`, `Form ⤵ Storm ⤵ Norm ⤵ Perform ⤵`, `FUEP (Functional – Usable – Emotional – Persuasive)`, `FUTURE (Where do we keep plans?)`, `Grow the product through continuous validation`, `Lean Hypothesis`, `Listen to yr users? Always. Believe them? Sometimes.`, `Low Cost of Change`, `Make It {Work, Right, Fast}`, `Make People Awesome`, `Make Safety a Prerequisite`, `Minimal Standard of Care`, `Modern Agile`, `Outcomes vs. Outputs`, `PAST (Why did we do that?)`, `Pivotal`, `PRESENT (How do we converse?)`, `Progress Is Primarily Measured By Shipping {Code, Product}`, `R.A.C.I.`, `Release early and often`, `Red ⤵ Green ⤵ Refactor ⤵`, `Scrum`, `Short Feedback Loops`, `Small Batch Sizes`, `Software is a Team Sport`, `Story = Least Amt of Work w/ User-facing Value`, `Story = Placeholder for a Conversation`, `Strong Opinions Loosely Held`, `Sustainable Pace`, `Team != "Same ppl forever"`,

OH ONE MORE THING


GORDIAN

GORDIAN is a brand new, TDD'd, modular, general consensus engine.

Drop-in Replacement for Comet BFT. Easily customize components such as consensus strategies, p2p networking algorithms, hashing schemes, and signature schemes. Supports multiple concurrent proposals and BLS signature aggregation. Addresses bottlenecks in mempool and peer-to-peer networking. Comprehensive documentation and sample implementations. Compatible with various back-end systems & optimizations, including different encoding formats and efficient hashing algorithms like Blake3. Implements ABCI++. Potential for 10-1000x performance improvements over existing solutions. Multiple concurrent proposers enable better scaling for blockchain networks. Easier to maintain than custom forks. BLS signature aggregation.

IV. The Recap

1. As an ecosystem, we're being crushed by tech debt
2. As an ecosystem, we're working harder than we need to
3. As an ecosystem, there's competitive advantage in getting it right
4. There are cheap, effective answers in the Old Ways
5. Which of this makes sense to start trying on Monday?
6. Follow up w/ Strangelove or the ICF to learn more or get help

Thanks!

- @strangelovelabs
- @sick_fade
- @reecepbcups' *Interchain Intro Hackmos Workshop*, Friday, 10:30am