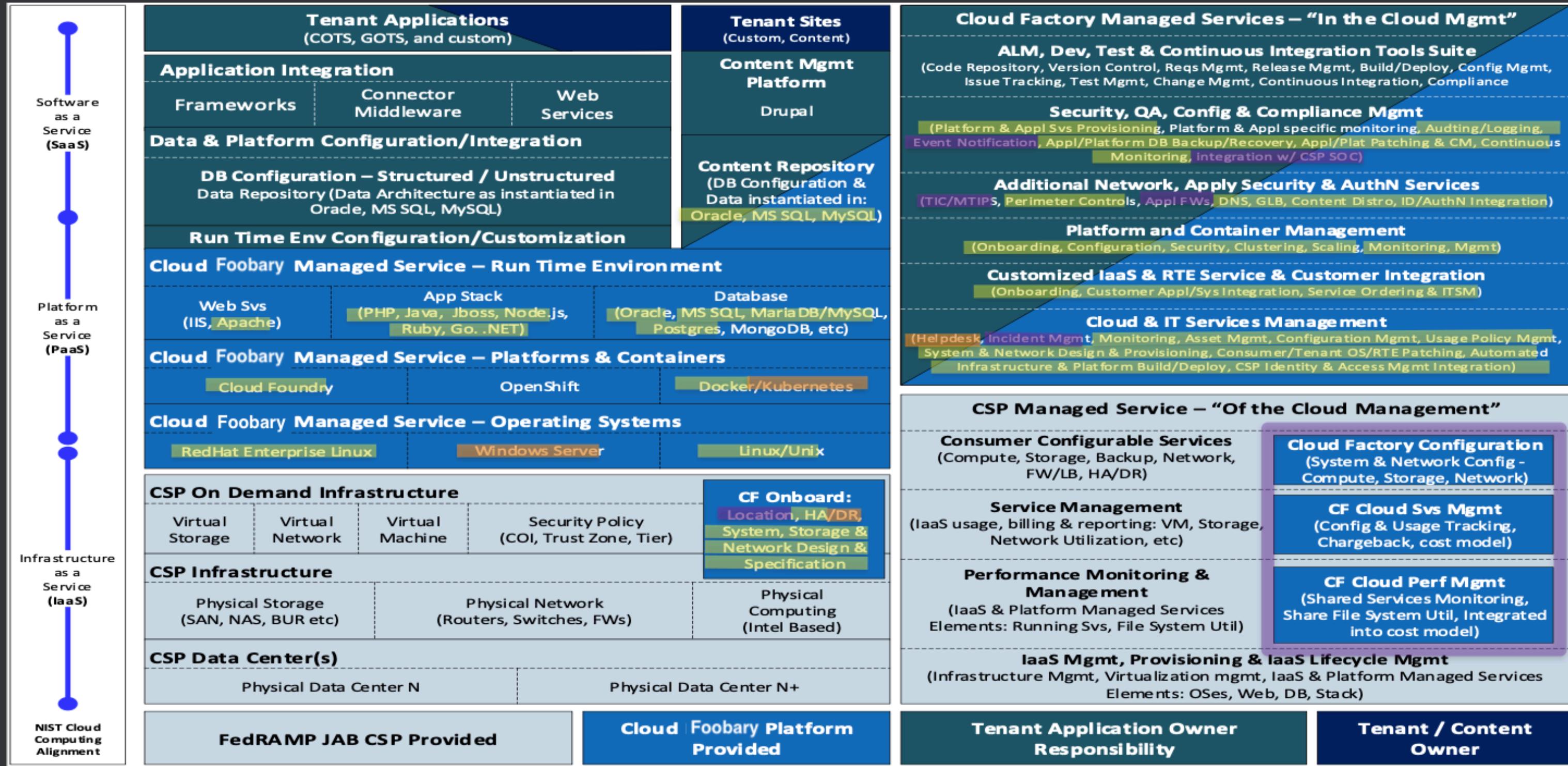


# Mnemonic Rules for Eponymous Laws

- SRECon EMEA 2024 , 2024-10-29
- Peter Burkholder

# Brace yourself....



# What I said:

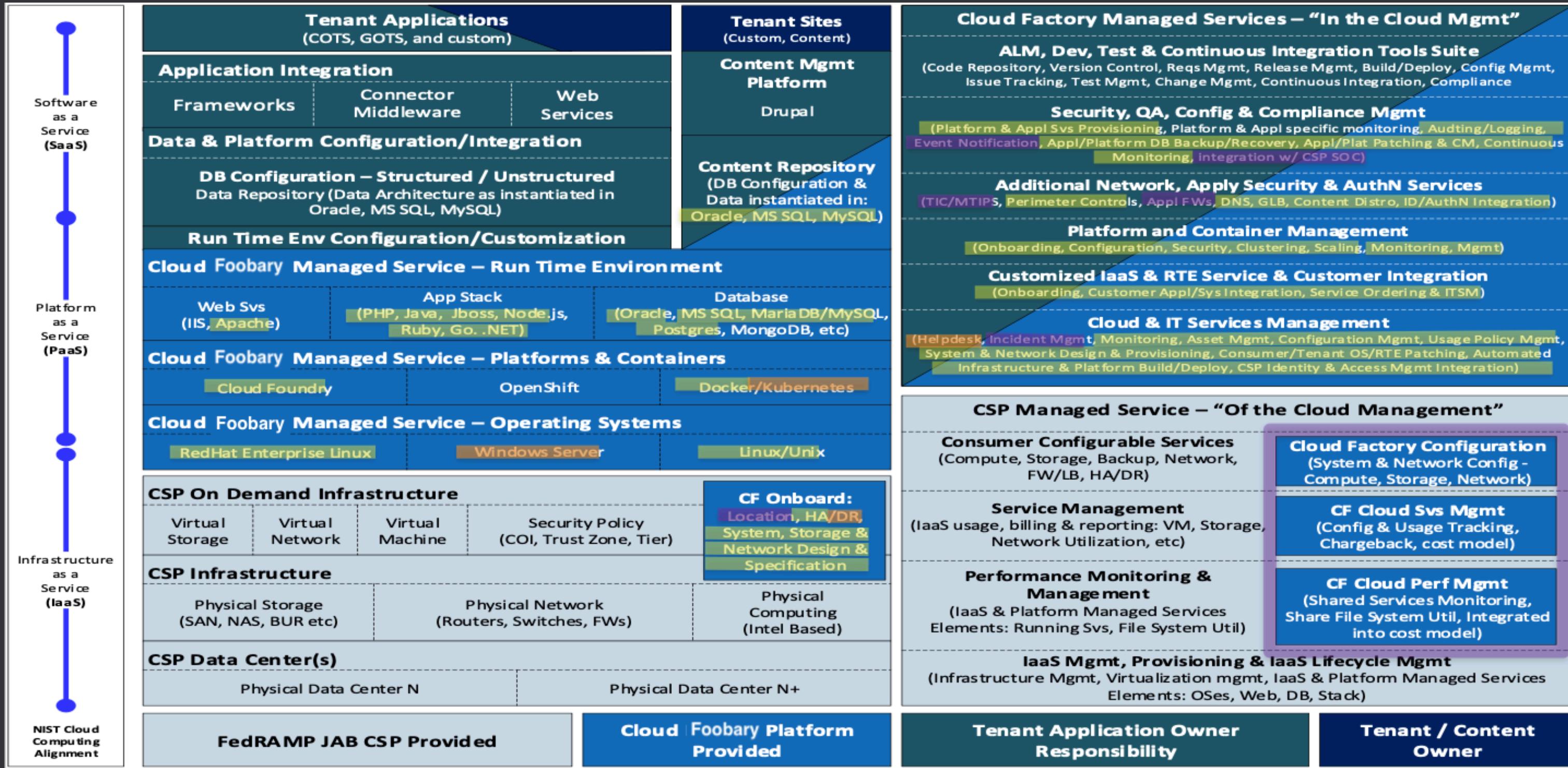
- How are you focussing on user experience without any users?
- Agile Development... Blah, blah, blah, Lean Enterprise, .... MVP

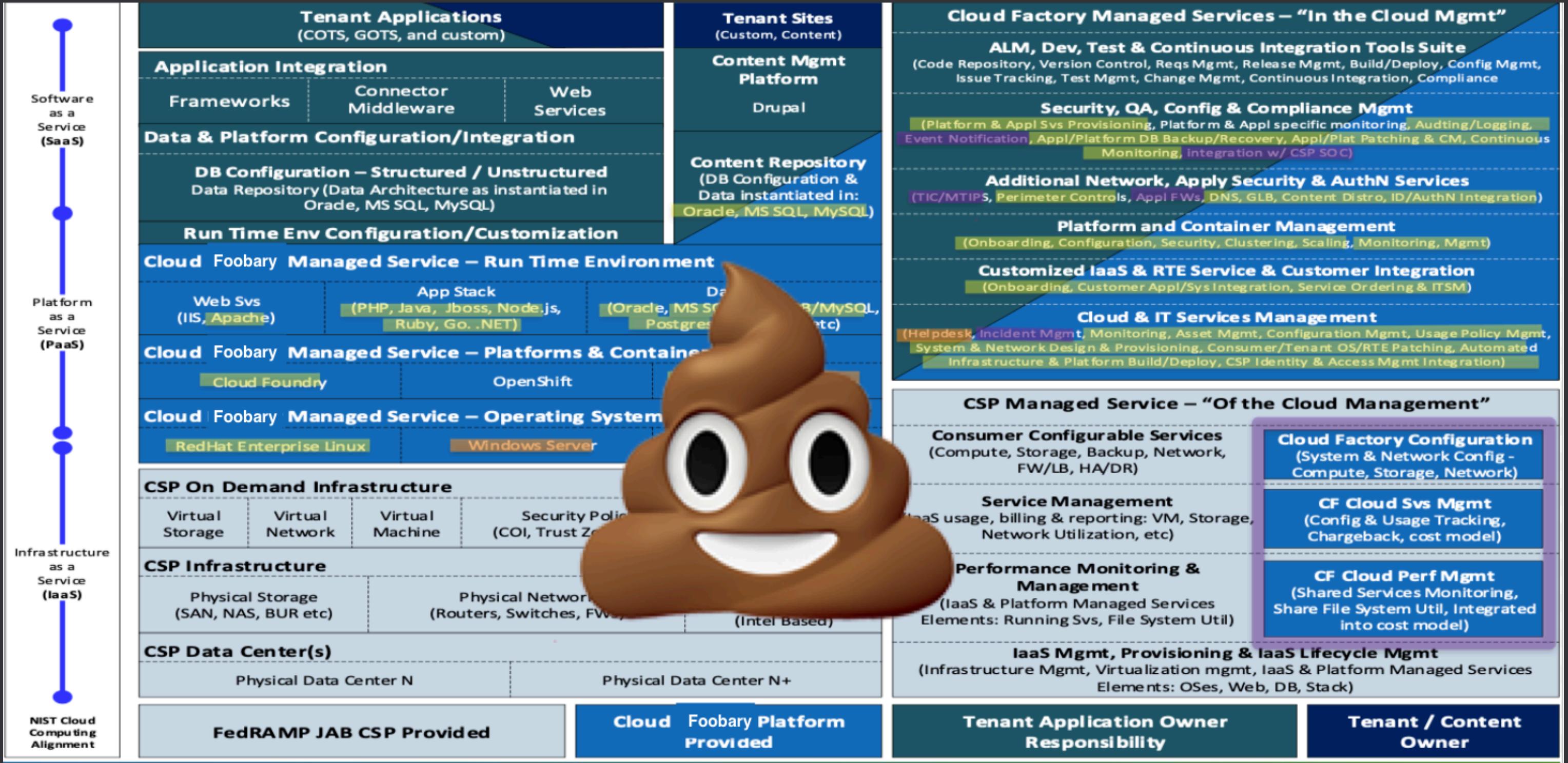
# What I needed:

- Eponymous Principle: a law named for a person (from Greek eponymos "given as a name")
- Mnemonic Rule: a trick for recall (from Greek mnēmē "memory")

# Mnemonic Tricks

To build a memory ... it has to be a little bit weird  
— Per Sederberg (Psychologist, University of Virginia)





# Evolution of Digestion and 💩

- Worm Digestion:
  - A simple system that works
  - Eats continually, digestive system produces bile continuously
- Human digestion:
  - A complex systems that works
  - We eat big meals, liver stores bile in the **GALL**bladder
- **Gall**: Mnemonic for ...



# Gall's Law

- "A complex system designed from scratch never works, and cannot be patched ... to make it work. You have to start ... with a working simple system."
  - *John Gall, M.D. 1975, General Systemantics*
- Every complex system that works has evolved from a simple system that works.
- Mnemonic: Graphic imagery, digestive system, and **GALL** bladders

# Mnemonic Tricks for Eponymous Principles

- Peter Burkholder (*he/him*)
- US Gov (Cloud.gov), Chef Software, NIH, NCAR, PacNW Seismic Lab
- @pburkholder most places (bsky, LI, infosec.exchange)
- Geophysicist / Seismologist / Physics Teacher
- So: THERE WILL BE A QUIZ

# The power of Eponymous Principles

- Newton's Laws
  - Law of inertia, etc.
- Murphy's Law
  - Everything that can go wrong will
- Moore's Law
  - Compute power doubles every two years (so far)

# What makes for a good eponymous principle?

- True - with empirical evidence, or
- True - with weight of lived experience
- Predictive or explanatory value

# Speaking of predictive value...

Any idea how one might found out the fate of Cloud [REDACTED]? (edited)



10:36

[REDACTED] heya! checking the internal FISMA dashboard, it did not move forward and the overall effort is marked "retired".



**Peter Burkholder (OOO 10/24-11/3)** 11:13

Excellent! Confirms Gall's Law

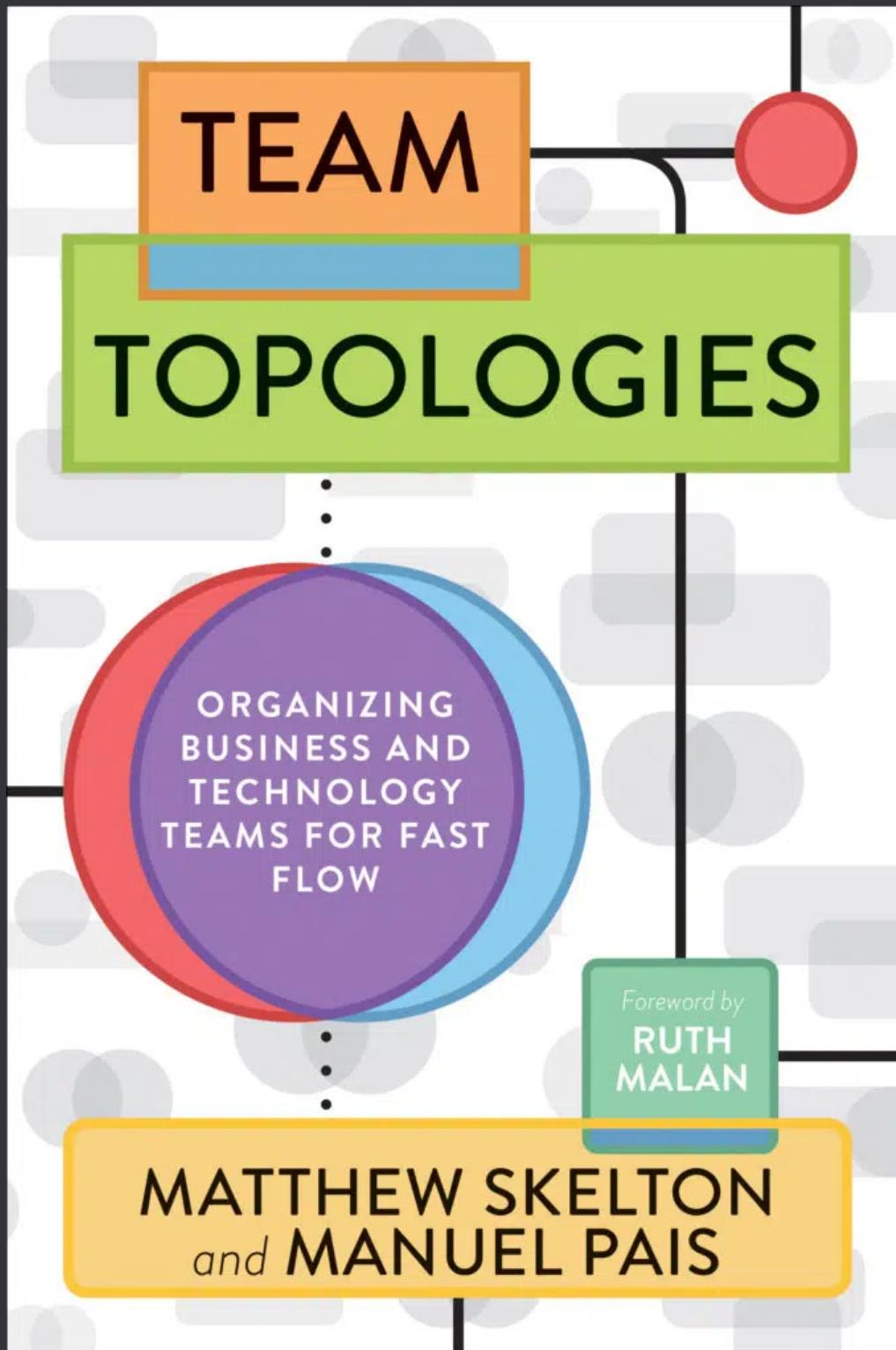
# Conway's Law

"Organizations which design systems...are constrained to produce designs which are copies of the communication structures of these organizations"

- *Melvin Conway, 1968*
- Or: Your architecture will mirror your org chart
- *Mnemonic: We CONstruct systems mirroring the WAY we communicate*
- Application: ...

# The Inverse Conway Maneuver

- Build teams to achieve the desired architecture
- Tech: Used bounded contexts and APIs along team bounds
- Orgs: Consider *Team Topologies* (Skelton & Pais, 2019)



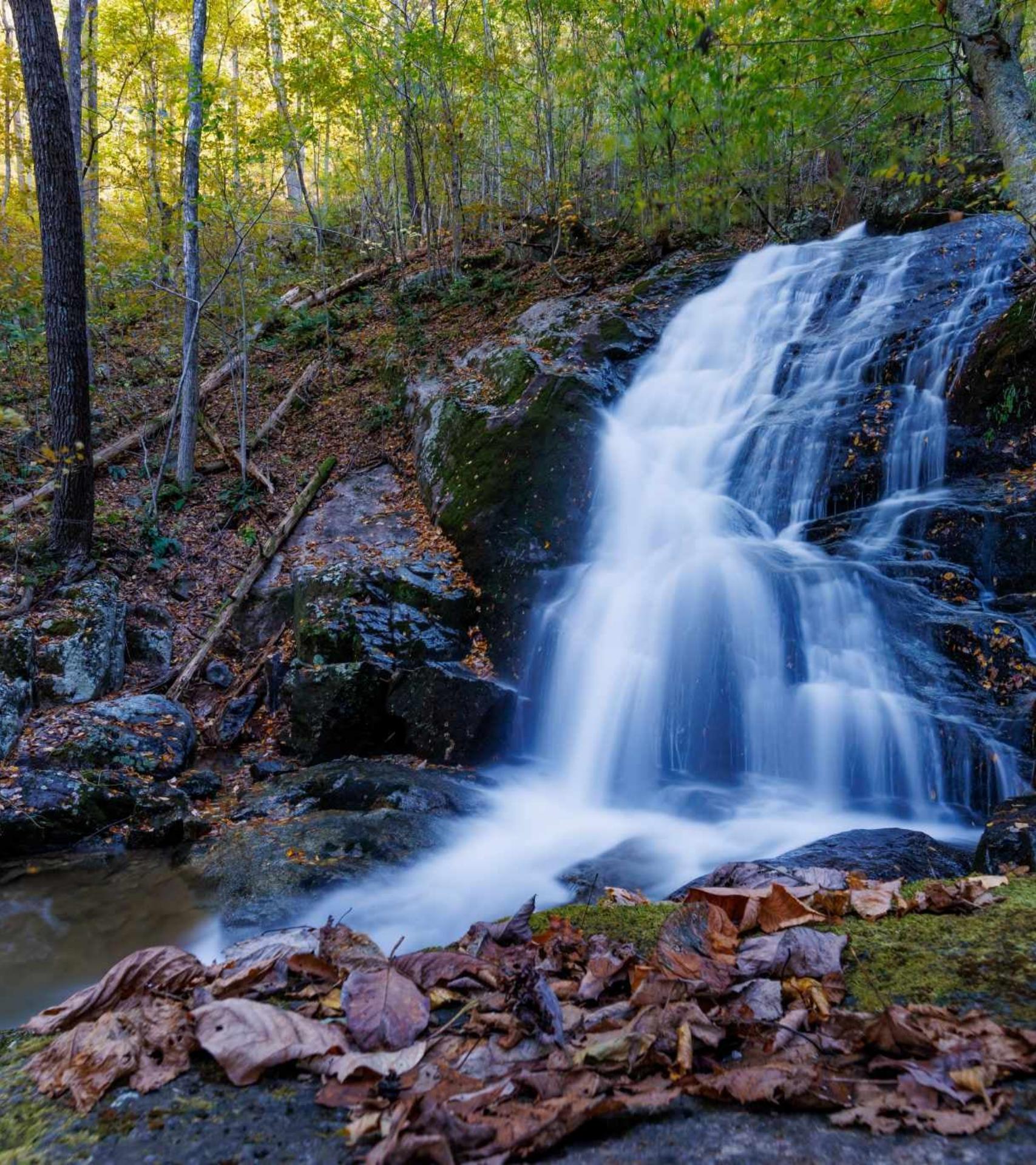
# Brooks Law

"Adding [engineers] to a late software project makes it later"

- *Fred Brooks, 1975, The Mythical Man Month*
- Mnemonic: The **BROOK** went over the waterfall<sup>1</sup>
- Why: onboarding time + geometrical growth in communication lines

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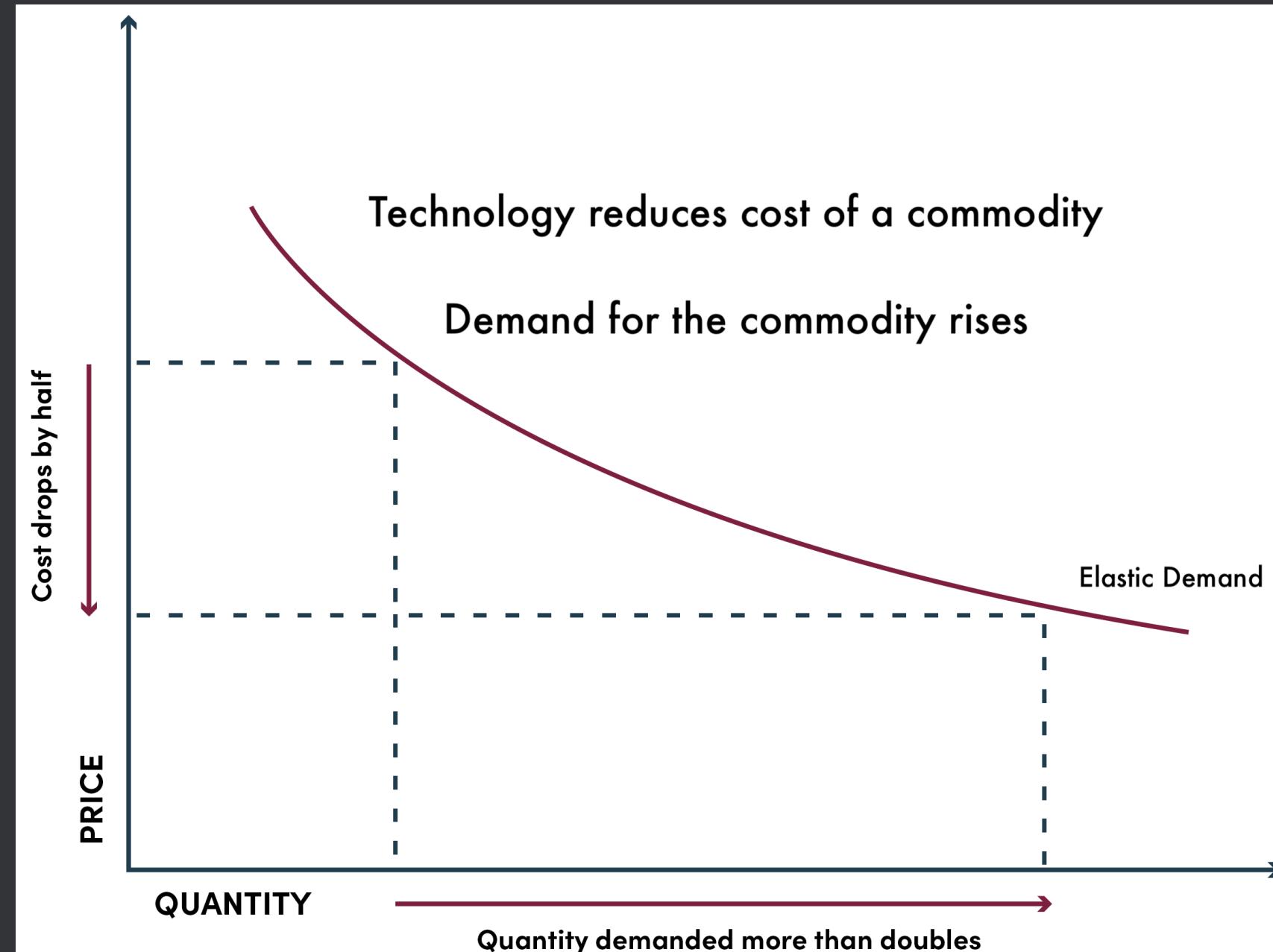
<sup>1</sup>James C. **Brooks**, @shootjamesshoot / instagram



# Jevons' Paradox

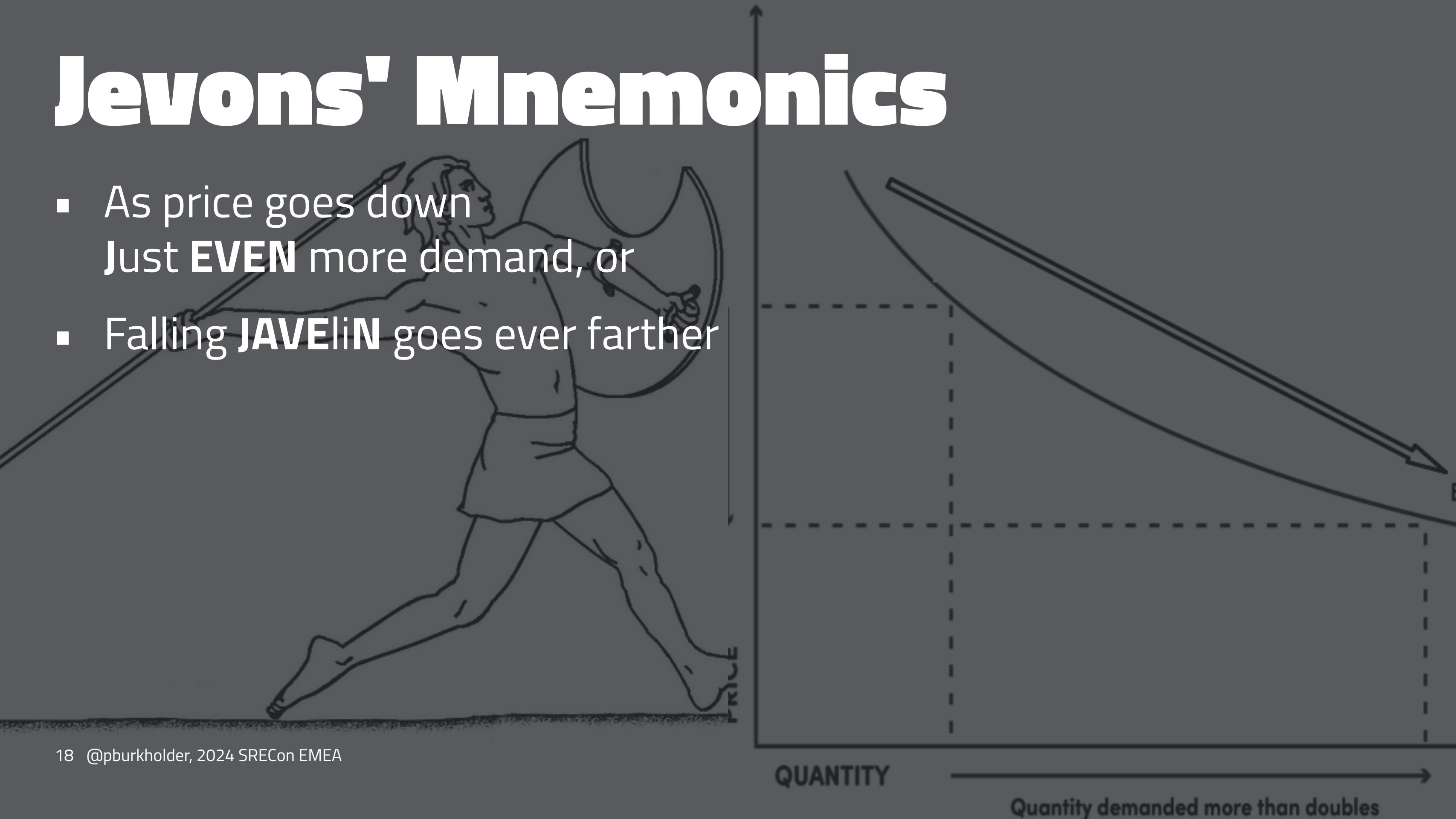
As the cost of an economically useful commodity decreases, total expenditure on the commodity grows  
— *William Stanley Jevons, 1865*

- Examples:
  - 1860s: Coal
  - 1970s: Automobile fuel efficiency
  - 2010s: Cloud spend
- See also: Moore's Law



# Jevons' Mnemonics

- As price goes down  
Just **EVEN** more demand, or
- Falling **JAVELiN** goes ever farther



# Pareto Principle

The 80/20 rule: 80% of a project is complete in 20% of the time

- *Joseph Juran, inspired by Vilfredo Pareto, 1941*
- Mnemonic:  
**PARE** down **TO** 80% of work with 20% effort
- Statistically: Power-law probability distribution
  - *Pareto Distribution*

# Pareto Distributions

$\alpha = \infty$

Many small instances, but a few significant instances may account for most of the impact

■ Earthquake magnitudes

—  $\alpha = 2$

■ Rainfall events

—  $\alpha = 1$

■ Size of files transferred on a network

■ Size of human settlements

■ Generally: Confounding Factors

# Pareto Principle

"In the last six months, we've been able to meet the needs of one-half of our users. We can meet the needs of the other half in another six months"

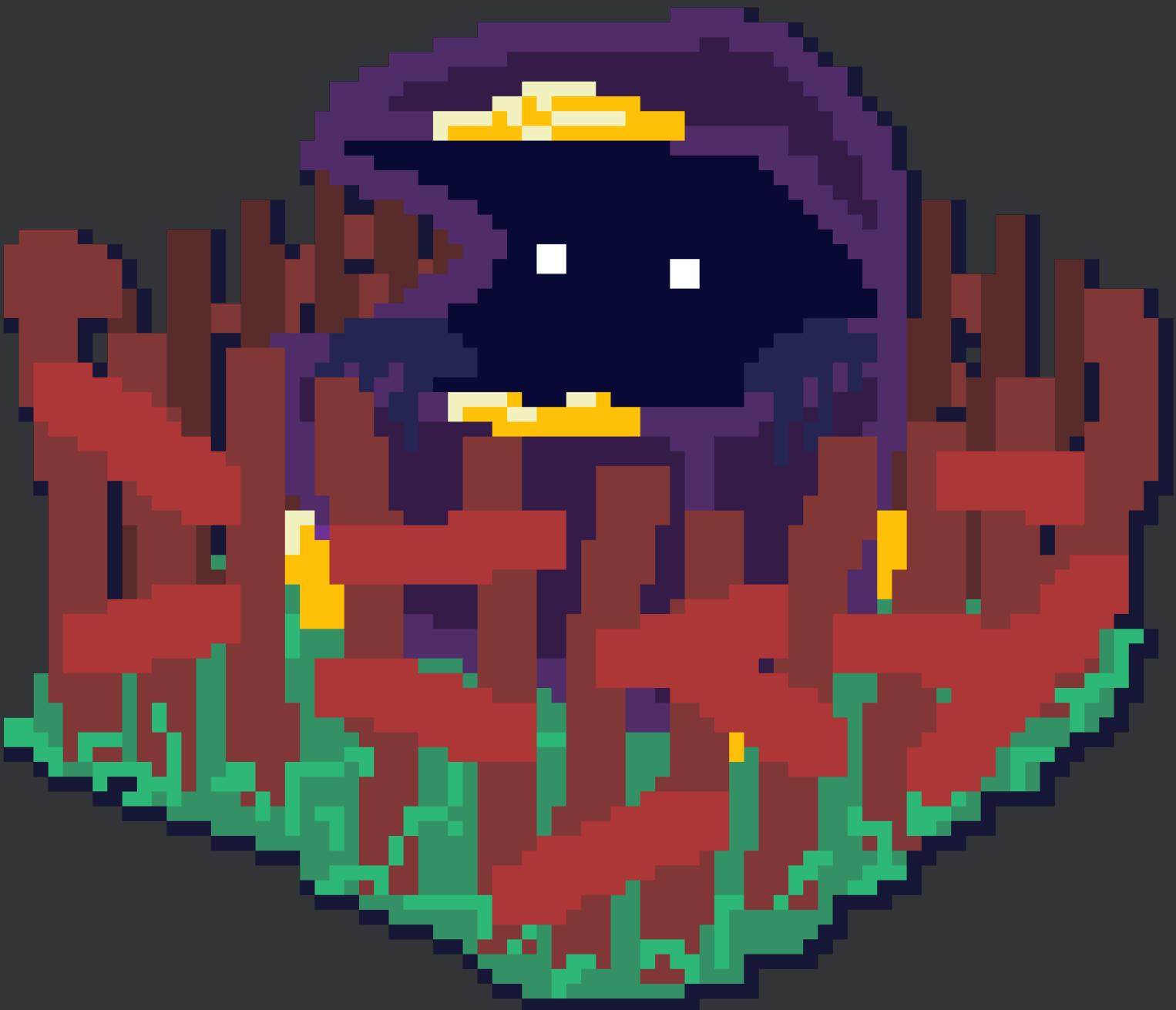
- Can you spot the problem here?

**If you don't see the use of [a fence]... Go away and think.**

**Then, when you can ... tell me the use of it, I may allow you to destroy it.**

**— G. K. Chesterton, 1929**

# Chesterton's Fence



Do not remove a fence until you know why it was put up in the first place.

- Mnemonic: That **CHEST** behind the **FENCE** - it may be a danger!
- Application:
  - Code Comments, ADRs (Architectural Decision Records), Pull/Merge Requests
  - Employee Retention

# Meme Laws

- True – with empirical evidence
- True – with weight of lived experience
- Feel true
- Predictive or explanatory value
- Build Community

# Meme Laws

## Hanlon's Razor

"Never attribute to malice what is better explained by incompetence"

-- Unknown

\* Mnemonic: Never attribute to *conspiracy* what is better explained by incompetence

-- Apocryphally Robert A. Heinlein



THE PUPPET MASTERS  
by Robert A. Heinlein

## Cunningham's Law

"The best way to get the right answer on the internet  
is not to ask a question; it's to post the wrong answer."

-- *Ward Cunningham*

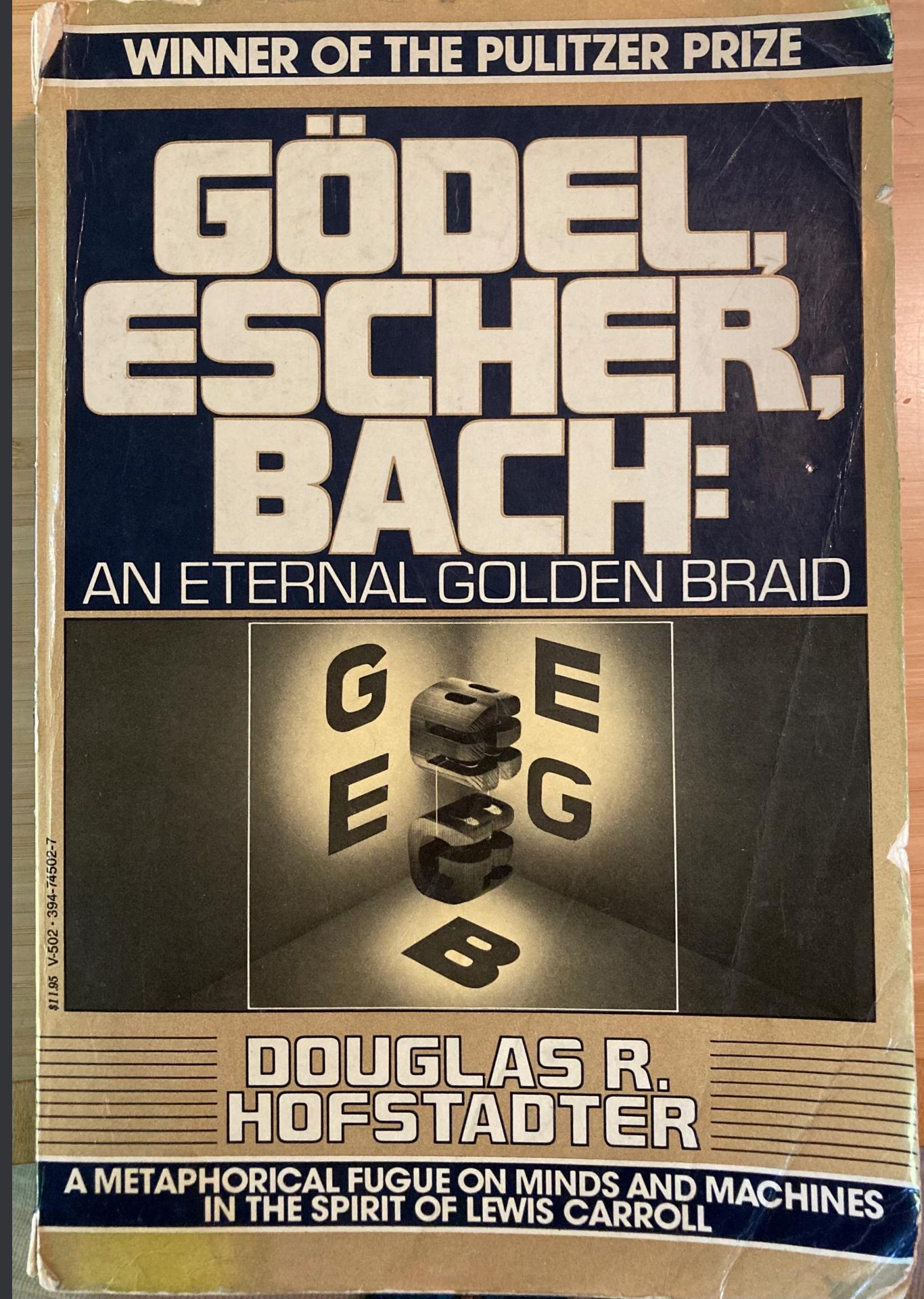
\* Mnemonic: Knowledge is COMING HOME when you  
post the wrong answer

## Hofstadter's Law

"It always takes longer than you expect, even when  
you take into account Hofstadter's Law."

-- *Douglas Hofstadter*, 1979

\* Mnemonic: Ha! Later...



# Whong's Law

"Every government agency, everywhere is working on a “new system”; It will solve all of their data problems and will be ready to use in 18-24 months."

-- *Chris Whong, 2018*

- Mnemonic: Data throng done long? Wrong, says Whong.
- See also: Gall's Law, Pareto Principle

# Quiz Time

- Galls' Law
- Conway's Law
- Brooks' Law
- Jevon's Paradox
- Pareto Principle
- Chesterton's Fence
- Hanlon's Law
- Cunningham's Law
- Hofstatder's Law
- Whong's Law

# What law explains this?

To meet the specified contract deadlines,  
we've added a DevOps team. But now we're further behind schedule!

Answer:

- Brooks's Law
- Whong's Law
- Conway's Law
-

# What law explains this?

To meet the specified contract deadlines,  
we've added a DevOps team. But now we're further behind schedule!

Answer:

- Brooks's Law
- Whong's Law
- Conway's Law
- Mnemonic: The BROOK goes over the waterfall

# Fill in the blank

We have five teams assigned to a system that only has three major components. Time to apply an Inverse \_\_\_\_\_ Maneuver so we don't end up with five subsystems.

# Answer: CONWAY

We have five teams assigned to a system that only has three major components. Time to apply an Inverse **Conway** Maneuver so we don't end up with five subsystems.

- We **CON**struct systems the same **WAY** we're organized

# Fill in the blank

This proposed architecture is too complex. We'll have to start with a simpler initial *working* solution, otherwise we're doomed by \_\_\_\_\_ Law.

# Answer: Gall's Law

This proposed architecture is too complex. We'll have to start with a simpler initial *working* solution, otherwise we're doomed by **Gall's Law**.

- 💩 architecture -> digestive evolution -> **GALL** bladder

# How do you respond?

Argument: We're vastly improving the energy efficiency of Large Language Models, so don't worry about the environmental impact.

Response: Sorry, but are you familiar with \_\_\_\_\_ ??

# Answer: Jevon's Paradox

Argument: We're vastly improving the energy efficiency of Large Language Models, so don't worry about their environmental impact.

Response: Sorry, but are you familiar with **Jevons' Paradox??**

Mnemonic: Just **EVEN** more demand as efficiency improves.



**Heather Battaglia (18F) (DEN)** Nov

27th at 6:26 PM

why is it that no matter how realistic I try to be with my time estimates, everything is always at least double the time I think it is

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3 replies

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**James Tranovich (18F - SF - he/him)**

13 days ago

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**Heather Battaglia (18F) (DEN)**  Nov

27th at 6:26 PM

why is it that no matter how realistic I try to be with my time estimates, everything is always at least double the time I think it is

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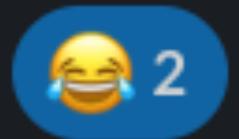
3 replies



**James Tranovich (18F - SF - he/him)**

13 days ago

Hofstadter's law!



# Thank you

And laws to look forward to in a future version

- Goodhart's Law
- Overton Window
- G.I. Joe Fallacy
- Dunning Kruger
- Metcalf's Law
- Parkinson's Law
- Dunbar's Number

**And thank you to Usenix & the SRECon organizers**

# Resources

- This talk: <https://github.com/pburkholder/eponymous-principles>
- Laws of Software: <https://laws-of-software.com>