Systems Thinking

FOR ENGINEERING LEADERS

About Me

Hey! I'm Stacy Vicknair.

I've been in software development for 18 years, and in engineering leadership the last 9 years

Microsoft MVP, 2009 – 2015

This year I went solo, focusing on helping SaaS social enterprise founders unclog their software development processes.

https://stacyvicknair.com

Help! I *need* your feedback!

stacy@stacyvicknair.com

Agenda

The Basics

Deriving Metrics

Optimizing Flow

Broader Applications

Additional Resources

The Basics

The Basics: What is it?

"A system is a set of things – people, cells, molecules, or whatever – interconnected in such a way that they produce their own pattern of behavior over time."

– *Systems Thinking: A Primer* by Donella Meadows

The Basics: A Caveat

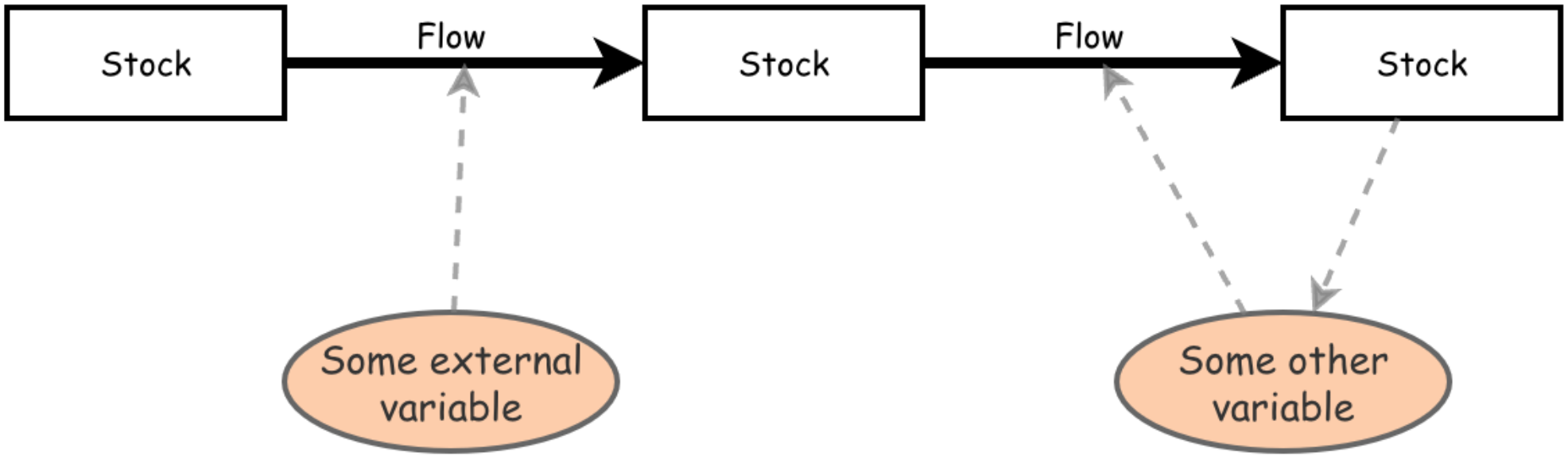
- Everything we think we know about the world is a model.
- Our models do have a strong congruence with the world.
- Our models fall far short of representing the real world fully.

– *Systems Thinking: A Primer* by Donella Meadows

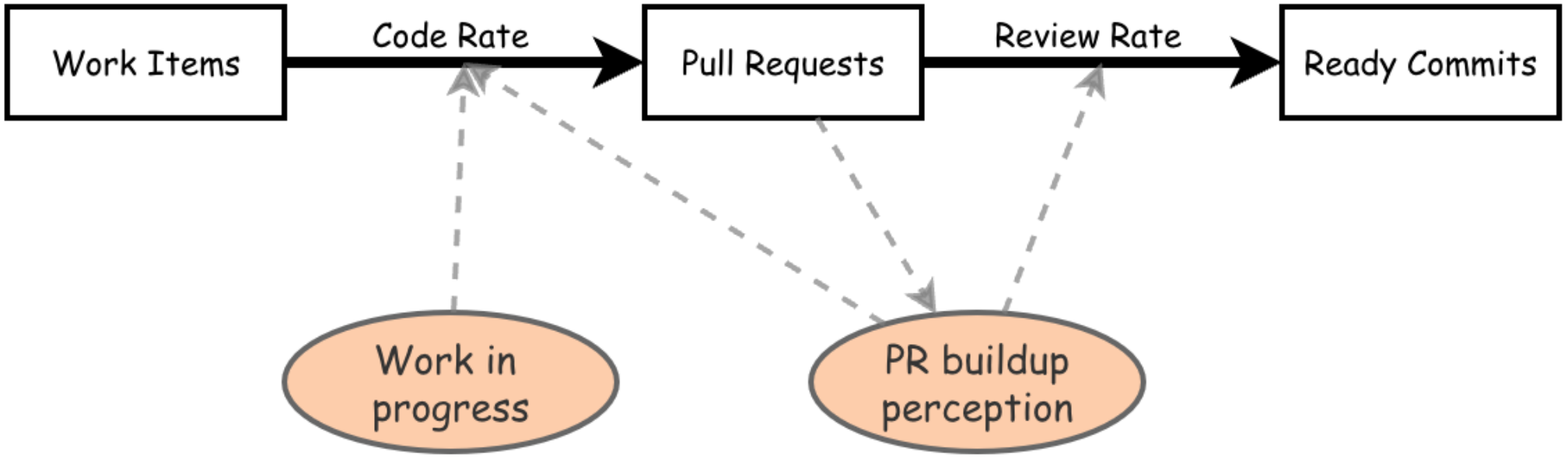
The Basics: Stocks and Flows

The Basics: Stocks and Flows

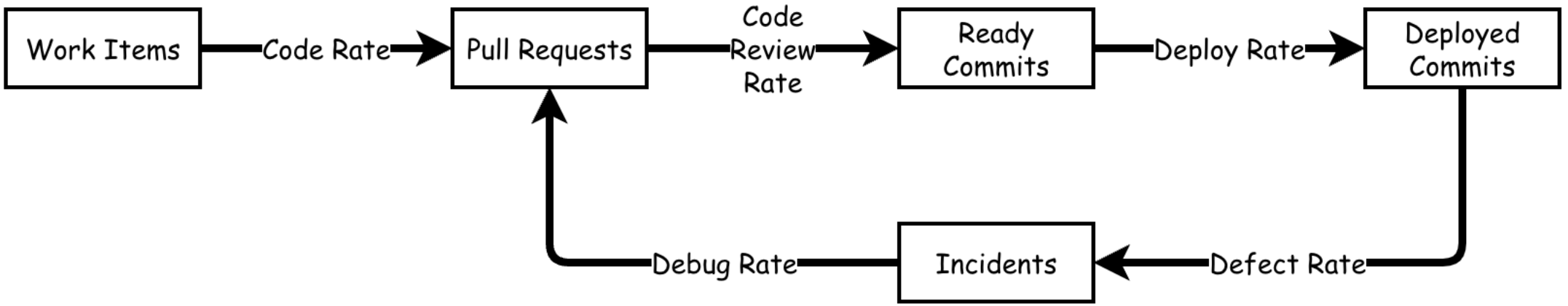
The Basics: Variables and Links



The Basics: Variables and Links



An Example Process

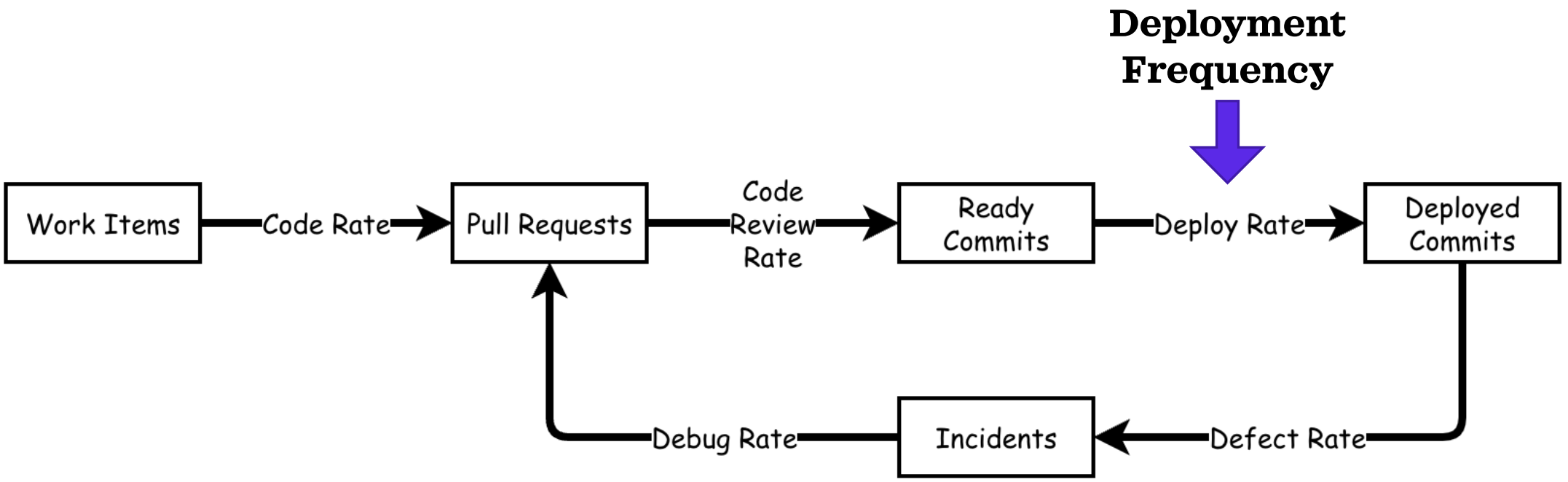


Deriving Metrics

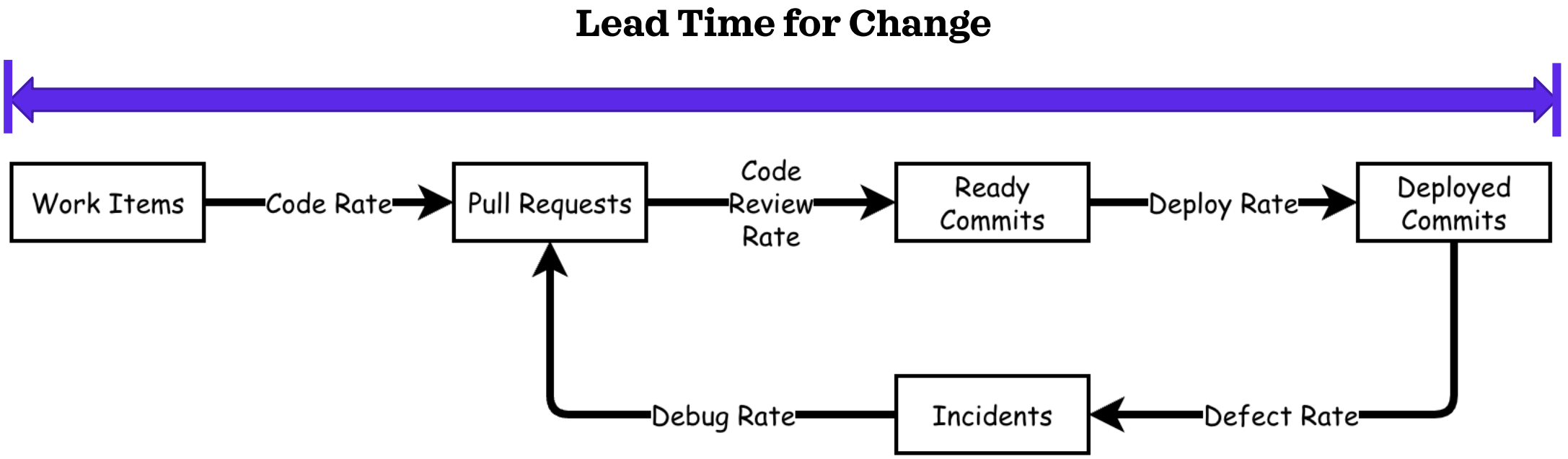
The DORA Metrics

- Deployment Frequency
- Lead Time for Changes (Cycle Time)
- Change Failure Rate (CFR)
- Time to Restore Service (Mean Time to Recover or MTTR)

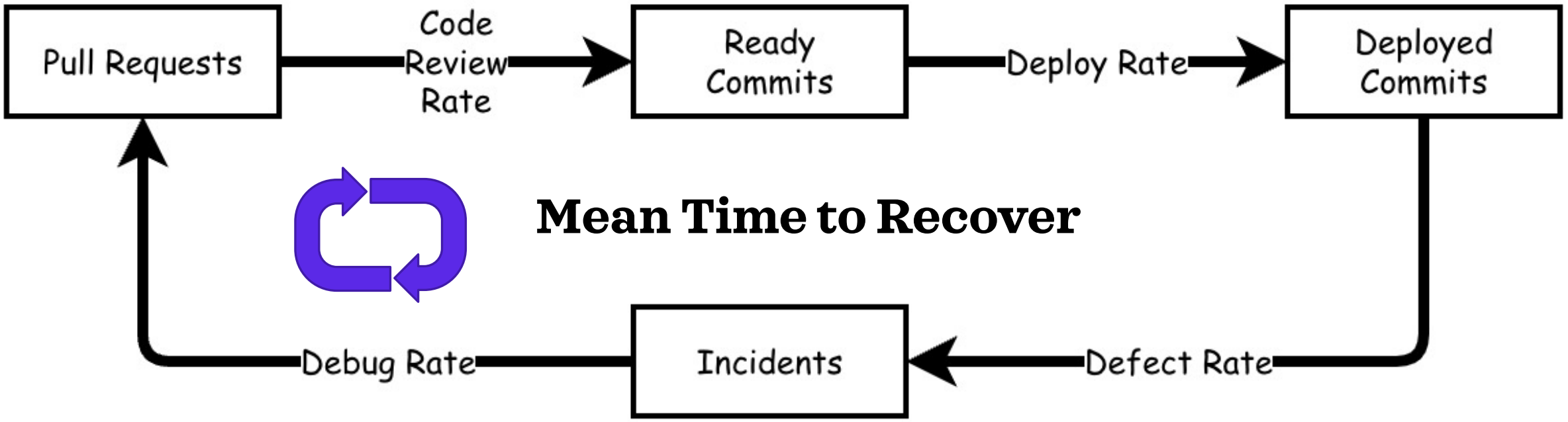
Deriving Metrics: Flow Rates



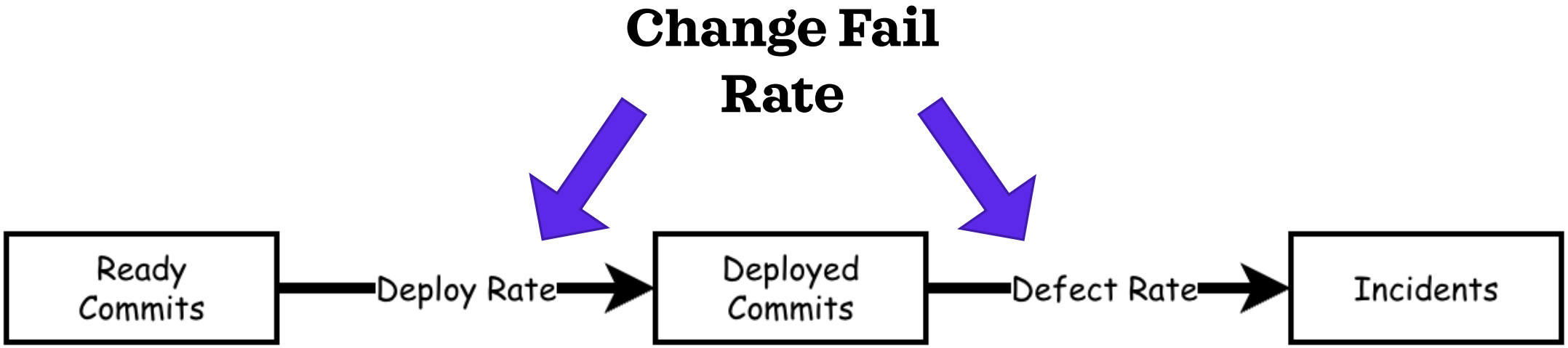
Deriving Metrics: Cycle Times



Deriving Metrics: Cycle Times (Again)



Deriving Metrics: Inflow vs Outflow



Deriving Metrics: A Note

"When a measure becomes a target, it ceases to be a good measure."

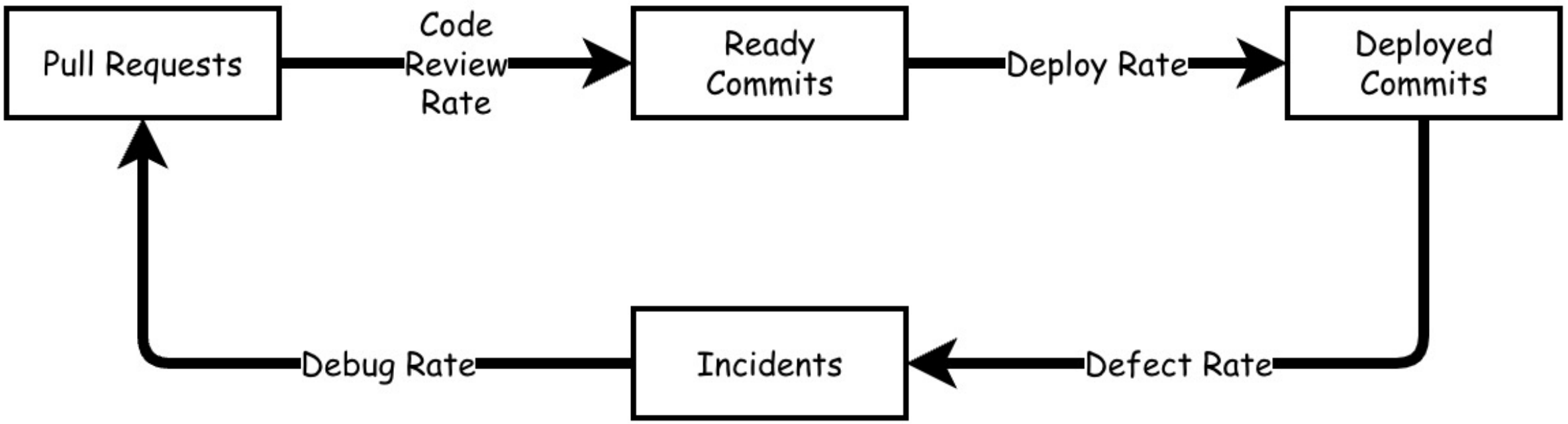
– Goodhart's Law

- Incentivized metrics become sub-optimal **real quick**.
- In addition to avoiding perverse incentives, balance metrics.

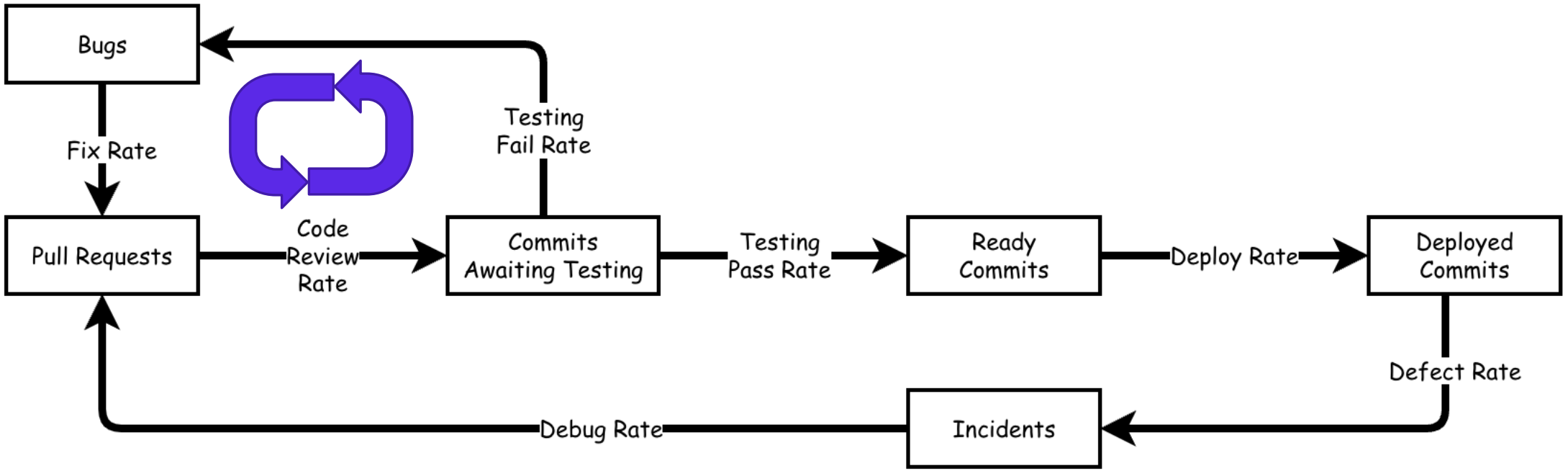
Optimizing Flow

Optimizing Flow: Bottlenecks

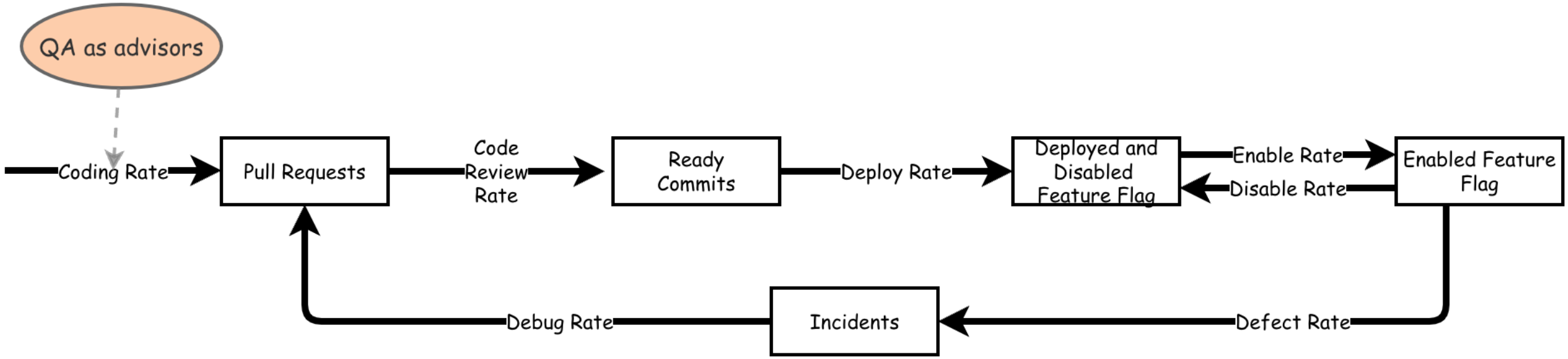
Optimizing Flow: Unavoidable loops



Optimizing Flow: Avoidable loops

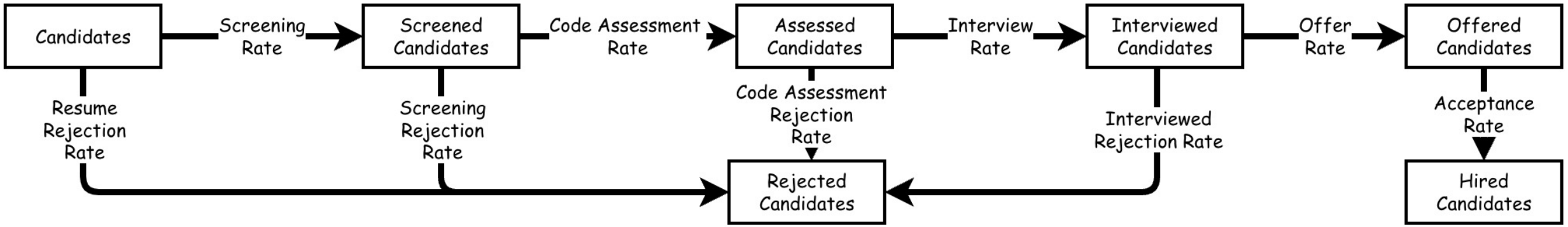


Optimizing Flow: Avoidable loops

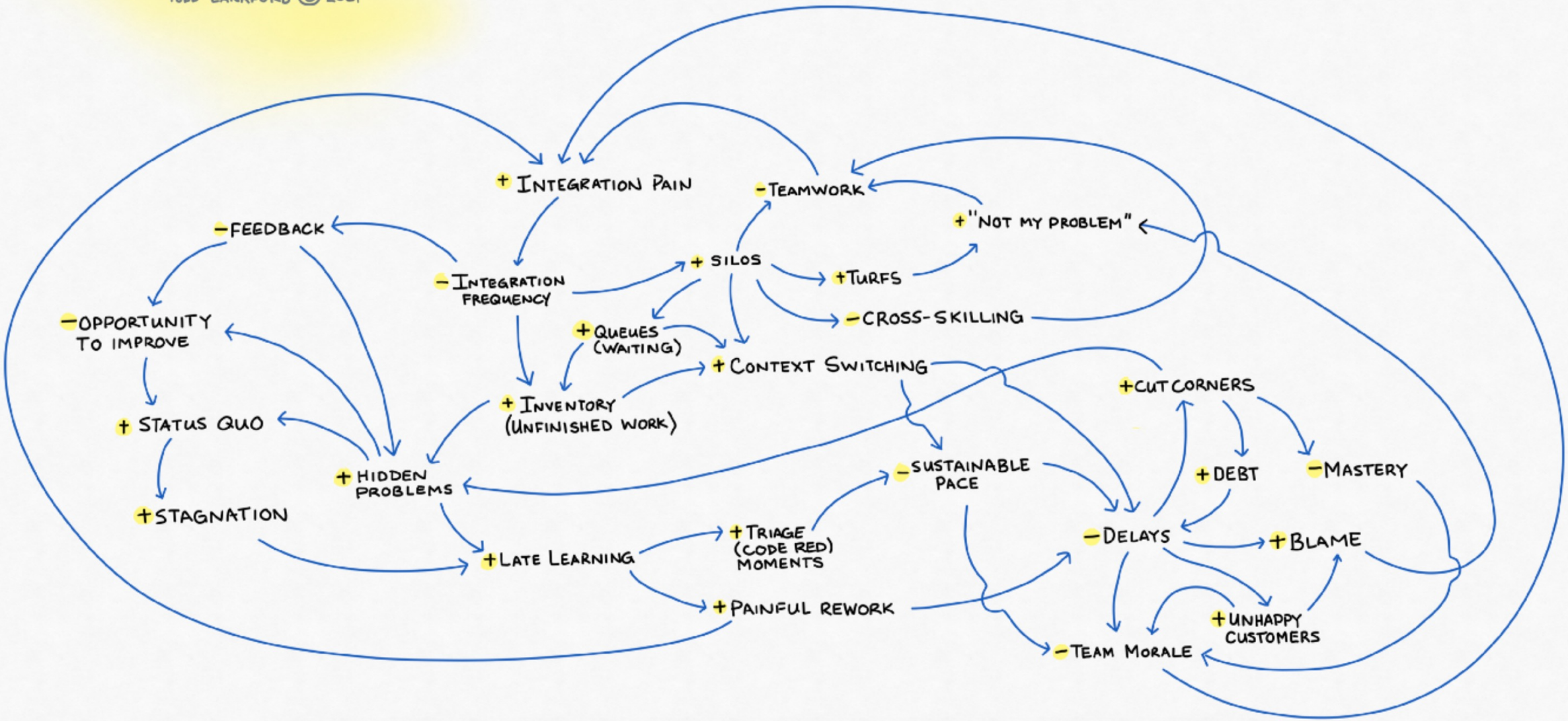


Broader Applications

Broader Applications: Hiring



The Wicked Impacts of Late Integration



Resources: Books

Systems Thinking: A Primer by Donella Meadows

An Elegant Puzzle by Will Larson

Accelerate by Nicole Forsgren PhD, Jez Humble, and Gene Kim

Resources: Links

https://lethain.com/systems-thinking/

https://insightmaker.com/

https://cloud.google.com/blog/products/devops-sre/using-the-four-keys-to-measure-your-devops-performance

https://queue.acm.org/detail.cfm?id=3454124

https://medium.com/serious-scrum/how-late-integration-inflicts-wicked-problems-on-your-scrum-teams-364dcc62bcc0

Questions?

Please email me your feedback!

stacy@stacyvicknair.com

https://stacyvicknair.com