



DevOps for Defense

August 2024

Back to DevOps Fundamentals

JD Black

<https://devopsfordefense.org>

<https://www.meetup.com/DevOps-for-Defense/>

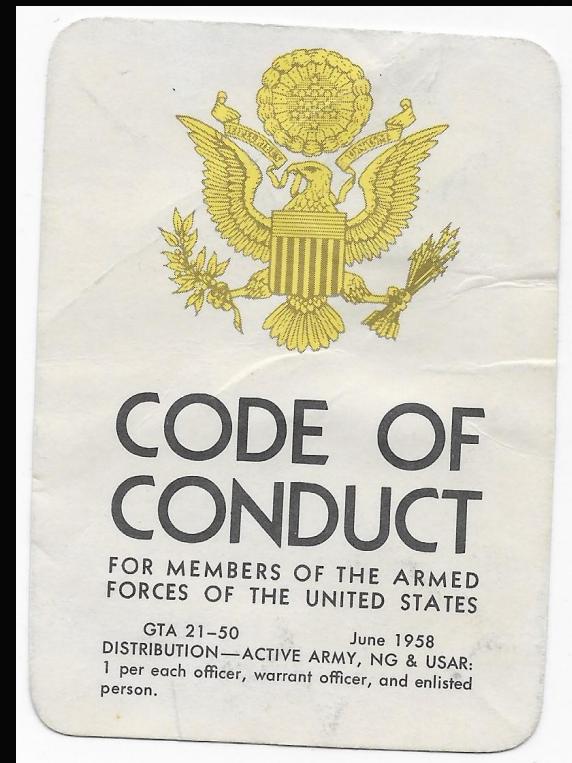
<https://github.com/jondavid-black/DevOpsForDefense>

devopsfordefense@gmail.com

<https://twitter.com/devops4defense>

DevOps for Defense Meetup: Code of Conduct

- UNCLASSIFIED ONLY!!!!
- Treat each other with respect and professionalism.
- Do not talk about private, sensitive, or proprietary work.
- Do talk about your experiences, needs, desires to improve work in our domain.
- Do share your thoughts.
- Do learn from others.
- Do respect & tip your bartenders!





DevOpsDays

BIRMINGHAM, AL

19-21 August 2024



Red Mountain Theatre Arts Campus
1600 3rd Ave S
Birmingham, AL 35233

ABOUT

devopsdays is a worldwide community conference series for anyone interested in IT improvement.

Conference Discount Code: **HSVDEFENSE**

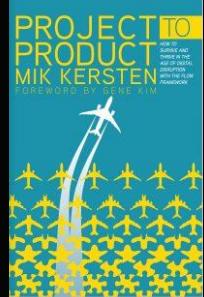


Hey, what's all this
DevOps stuff about?
What's the big deal?

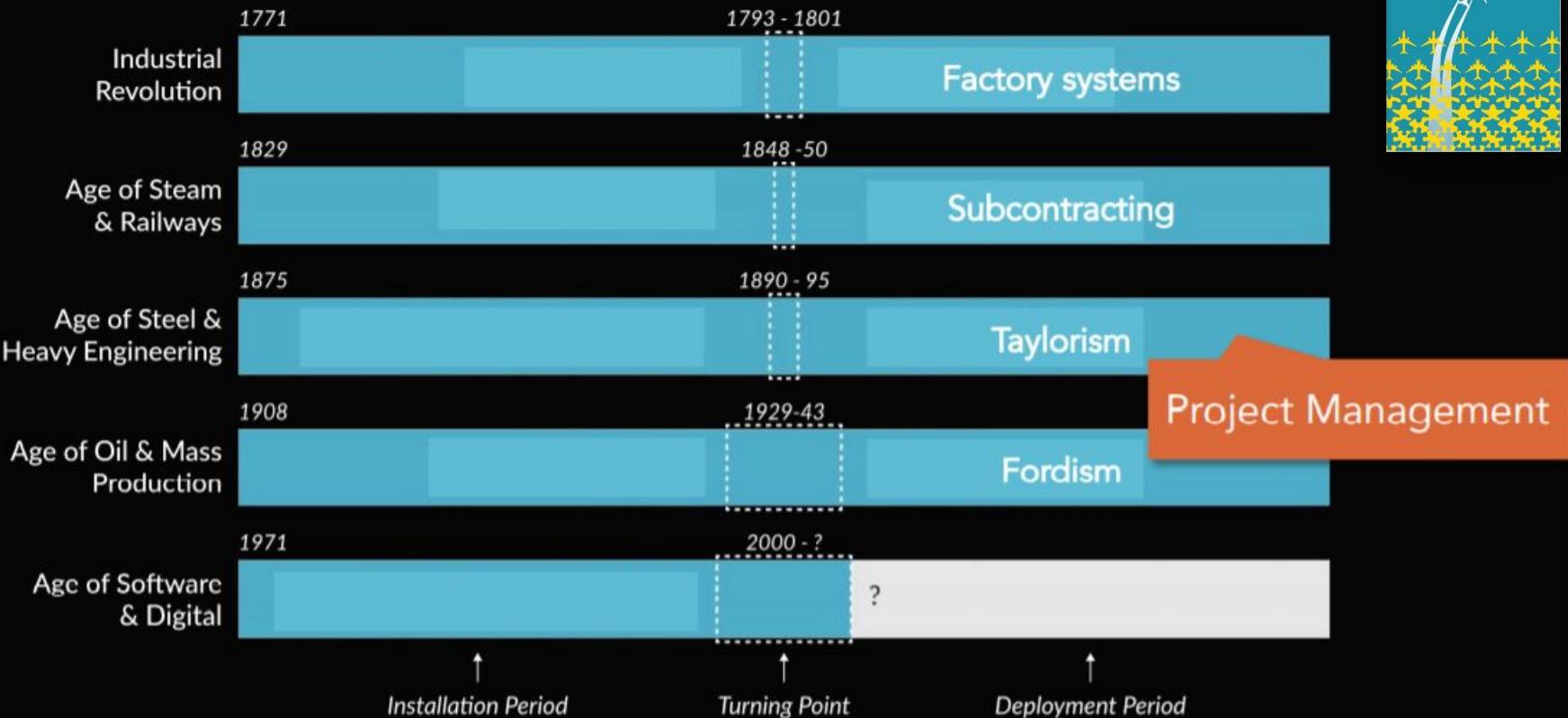
Hum, let me google
that for you!

Why all the fuss about DevOps?

1. DevOps is an economic force, not a “software thing”.
2. DevOps originated in industrial engineering and manufacturing, finding ways to produce high quality products cheaper and quicker.
3. DevOps is perceived as a “software thing” because software has embraced and tailored the principles and become a driving force in the current economy.



Technological Revolutions



Stock Price Change 2006-2016

amazon

1,910%



50% of S&P 500 projected
to be replaced in 10 years

Walmart 

2%

-95%
sears

-83%
JCPenney

-59%
KOHL'S

-49%
BEST BUY

-46%
★macy's

-21%
NORDSTROM

-15%
◎TARGET

The Global Economic Landscape has Changed

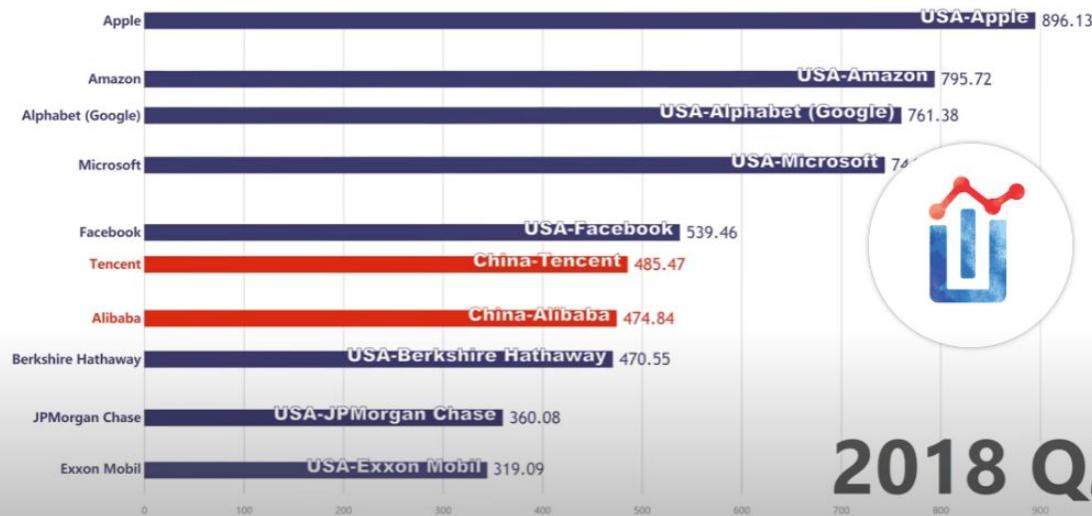
1998

Market Capitalization in Billions USD

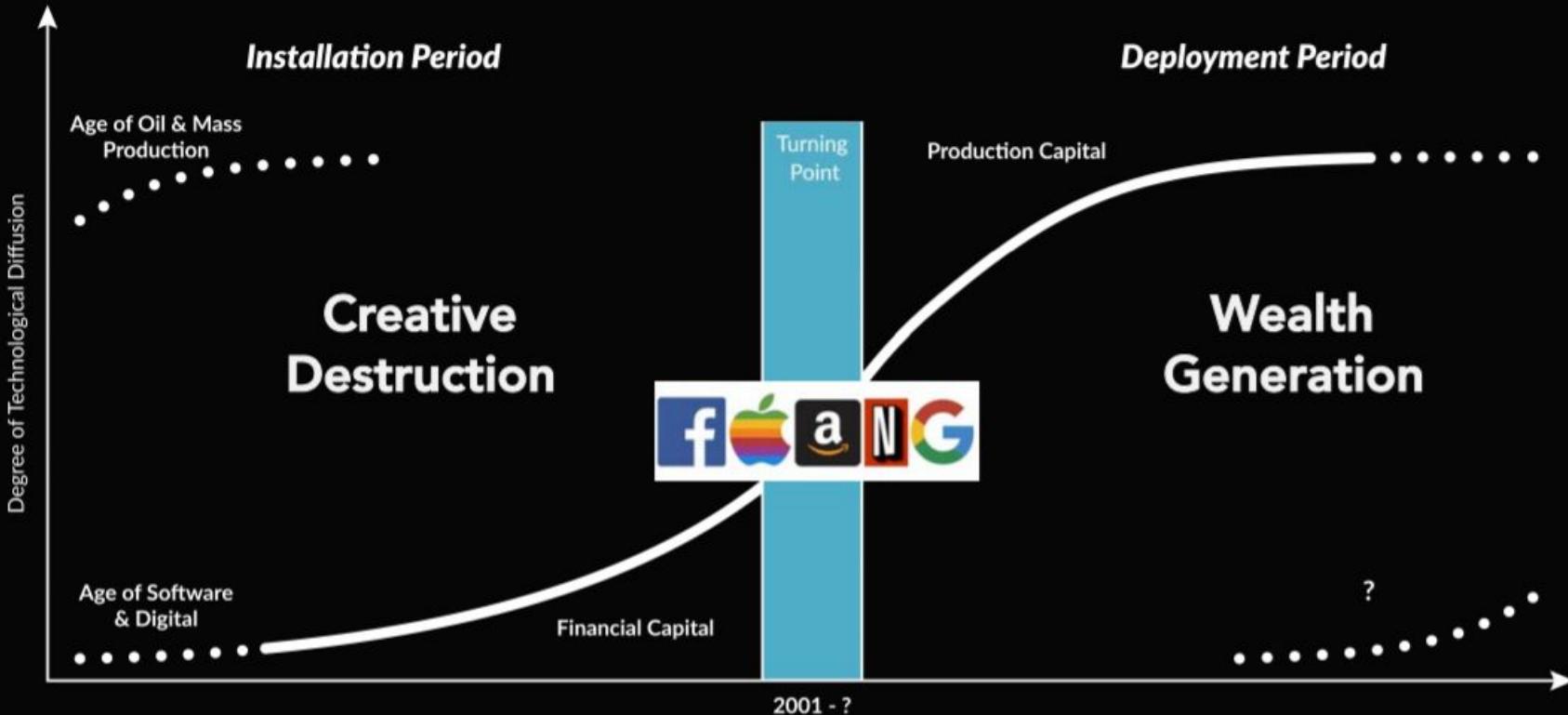


Source: Wawamu Stats
<https://youtu.be/fobx4wIS6W0>

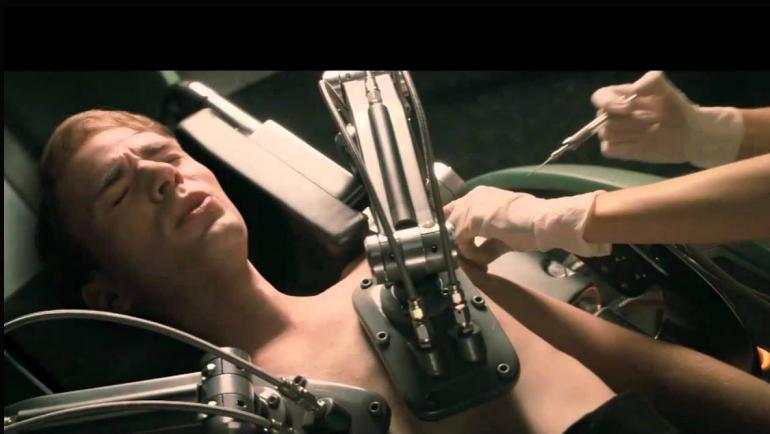
Market Capitalization in Billions USD



The Turning Point

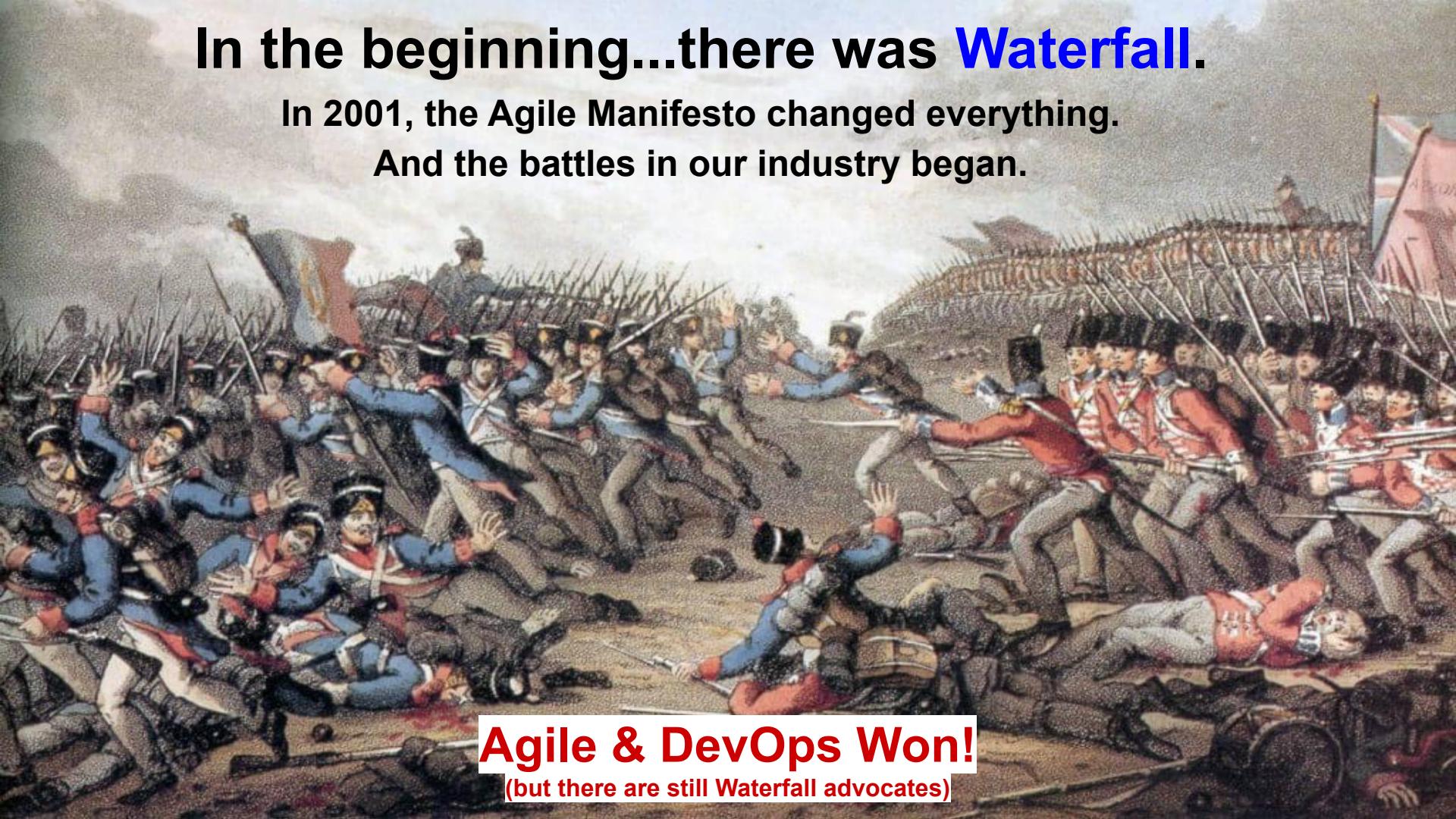


Origin Story



In the beginning...there was Waterfall.

In 2001, the Agile Manifesto changed everything.
And the battles in our industry began.



Agile & DevOps Won!
(but there are still Waterfall advocates)

History of DevOps

There is definitely a historical connection between DevOps and Agile. Starting all the way back in 2008 with Patrick Dubois presenting Agile Infrastructure and Operations at the Agile 2008 conference.

See The History of DevOps by Damon Edwards for more information



10 deploys per day
Dev & ops cooperation at Flickr

John Allspaw & Paul Hammond
Velocity 2009

My Definition of DevOps

The architecture, technical practices, and cultural norms that enable us to...

increase our ability to deliver applications and services...

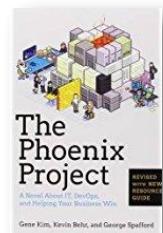
quickly and safely, which enables rapid experimentation and innovation, and the fastest delivery of value to our customers...

while ensuring world-class security, reliability, and stability...

...so that we can win in the marketplace.



Source: DevOps Handbook (Kim, Humble, Willis, Debois)

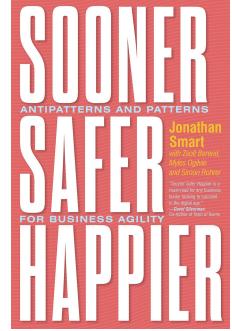


@RealGeneKim

Better Value, Sooner, Safer, Happier



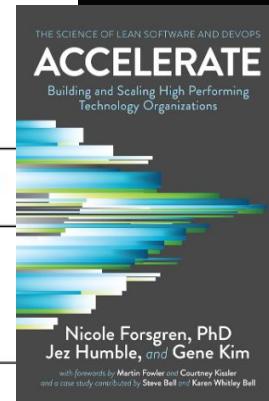
Source: Jon Smart, Partner, Founder, Sooner, Safer, Happier (@jonsmart)



@RealGeneKim

The Business Value of DevOps Is Even Higher Than We Thought

Elite vs. Low Performers



	Elite	Low	Difference
Deployment Frequency	On-demand (multiple times per day)	Monthly or quarterly	208x
Deployment Lead Time	< 1 hour	1 week to 1 month	106x
Deploy Failure Rate	0-15%	46-60%	7x
Mean Time to Restore	< 1 hour	Less than one day	2,604x

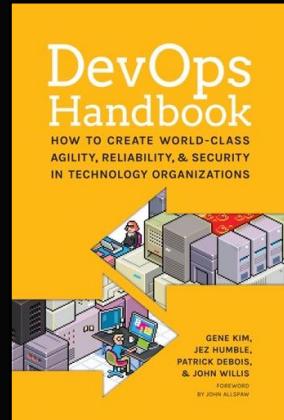
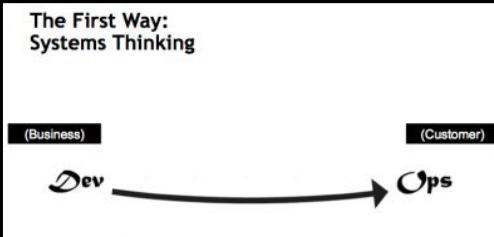


Source: Google/DORA: 2019 State Of DevOps Report: <https://cloud.google.com/devops/state-of-devops/>

@RealGeneKim

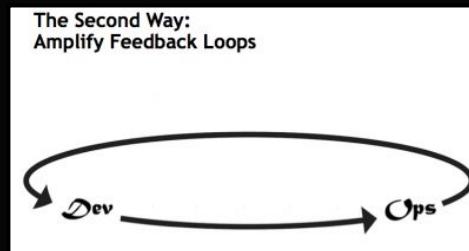
Core of DevOps

The 1st Way: Systems Thinking & Flow



Transform Your SW Lifecycle!

The 2nd Way: Feedback



COP 3331 Exam 1

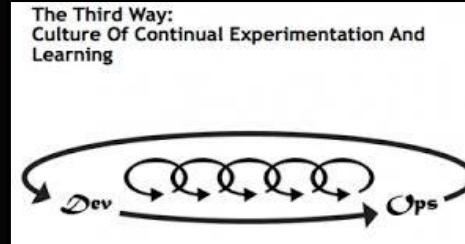
2 Short Answer Questions

11. [10 points] Name and describe the five key phases of software development.

~~1. denial
2. bargaining
3. Anger
4. depression
5. acceptance~~

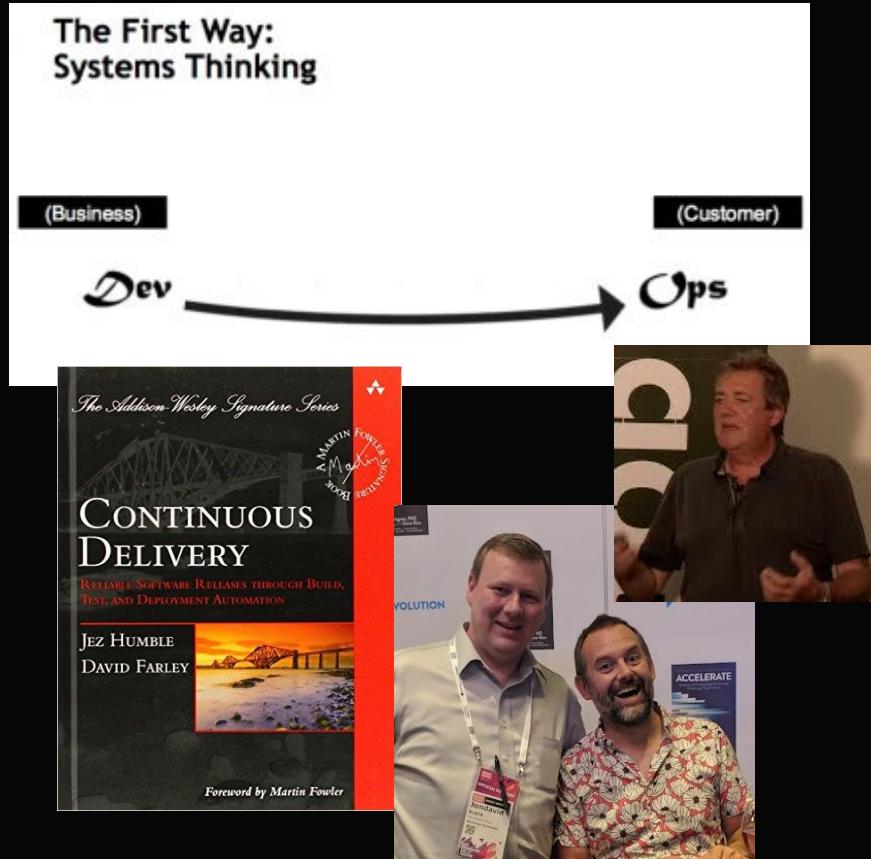


The 3rd Way: Experimentation & Learning



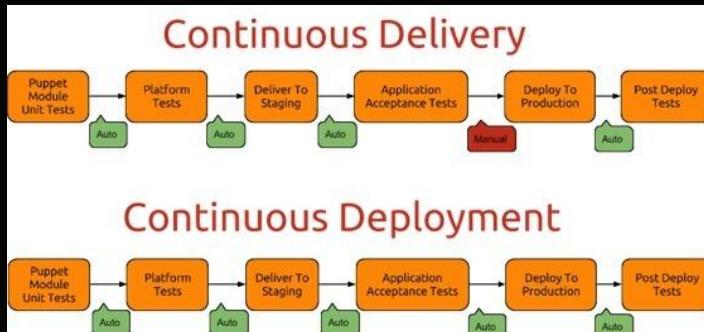
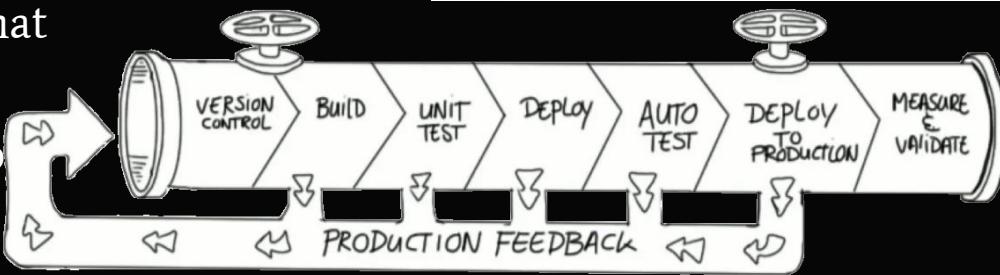
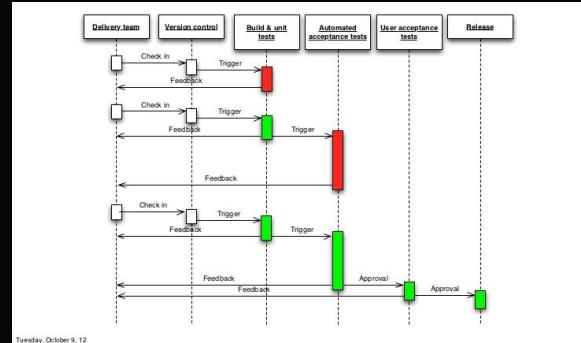
DevOps: The First Way - Systems Thinking & Flow

- Systems Thinking: “Emphasize the performance of the entire system, as opposed to the performance of a specific silo of work or department” - Gene Kim (2012)
 - Interpretation: Optimize the delivery of value to your customer across the organization recognizing that your delivery process is a system itself
- Flow: “Accelerate the delivery of work from Development to Operations to our customers” - Gene Kim (2016)
 - Interpretation: Build a Continuous Delivery pipeline! Feed it constantly!

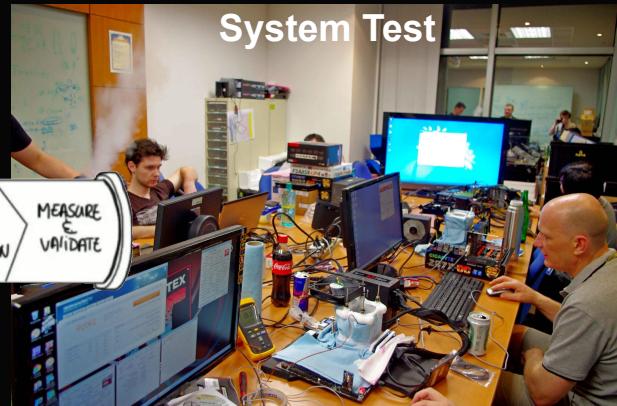


What is a Continuous Delivery Pipeline?

1. Automated suite of tools, triggered by an update to your product's configuration managed baseline, that performs all the build, test, QA, packaging, (and deployment) of your system.
2. Rapid feedback to engineers of issues introduced by a change
3. Continuous Integration...on steroids!
4. Your product's immune system
5. Your source of confidence



Tap All Your Sources of Feedback

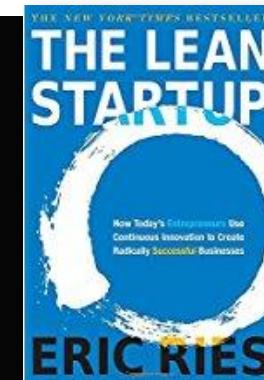
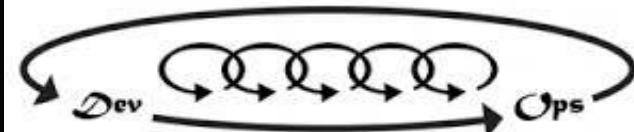


DevOps: The Third Way - Experimentation & Learning

- Knowing how to get smarter, faster matters a lot.
- Smarter faster means finding fault early and often.
- Easier said than done.

- Create opportunities for learning as quickly, frequently, cheaply, and as soon as possible.
- Learn from accidents and failures, which are inevitable when working within complex systems.
- Institutionalize rituals that increase safety, continuous improvement, and learning
 - Establish a just culture to make safety possible
 - Inject ~~production~~ failures to create resilience
 - Convert local discoveries into global improvements
 - Reserve time to create organizational improvements and learning

Culture Of Continual Experimentation And Learning



- "Outlearn the competition"

Define Your Experiment

Hypothesis Template

We believe that

[building this capability]

[for these people]

Will achieve [this outcome].

We know we are successful when we see

[this measure / metric / observation].

- adapted from Jeff Gothelf

The DevOps for Defense Meetup Hypothesis

creating a DevOps meetup

for defense industry professionals

a broad cultural transformation that improves DoD system development and mission value delivery by adapting commercial best practices to our domain

modern DevOps concepts and practices embraced by DoD and Industry to safely deliver greater value to our Warfighters

Limit the Blast Radius

Define in Your
Backlog

Blameless
Postmortems

Feature Toggles

Automate Deploy
& Roll-back

Versioned
Interfaces

Incremental
Evolution

Canary Releases

A/B Deployments



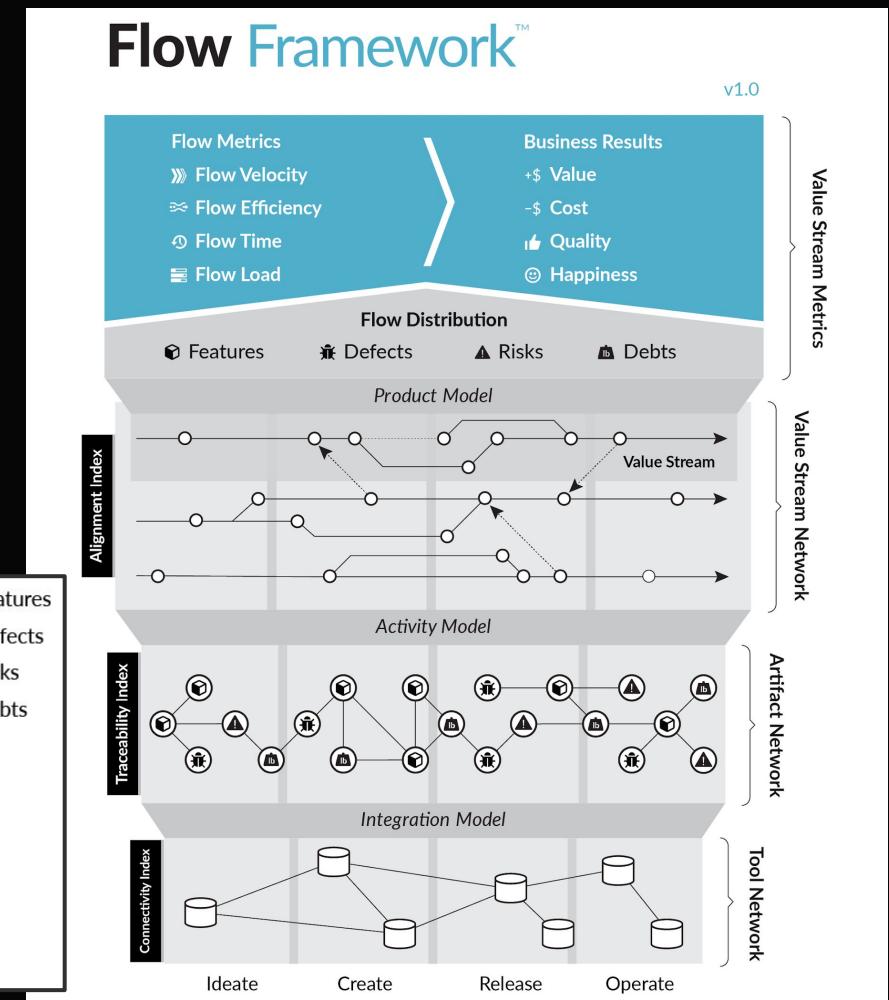
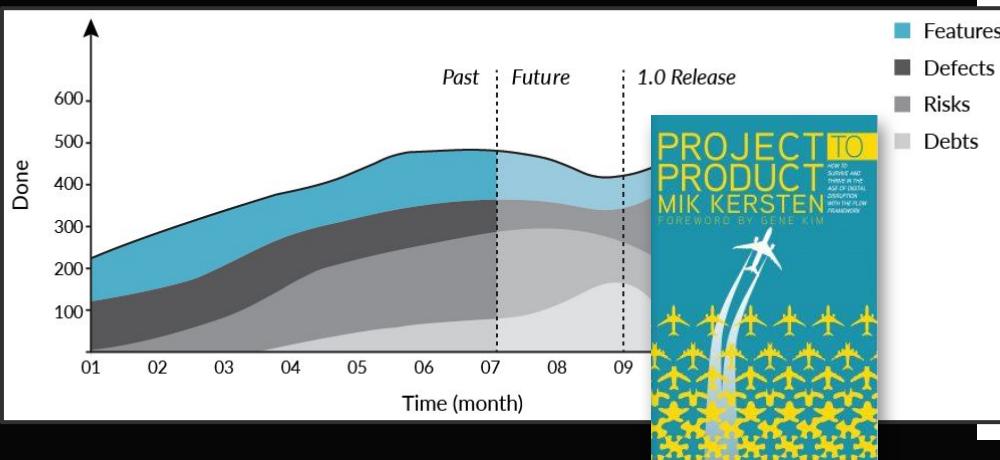
4 Types of Work

Features - Value Generation

Defects - Unplanned Mandatory Investment

Risks - Security, Reliability, Etc.

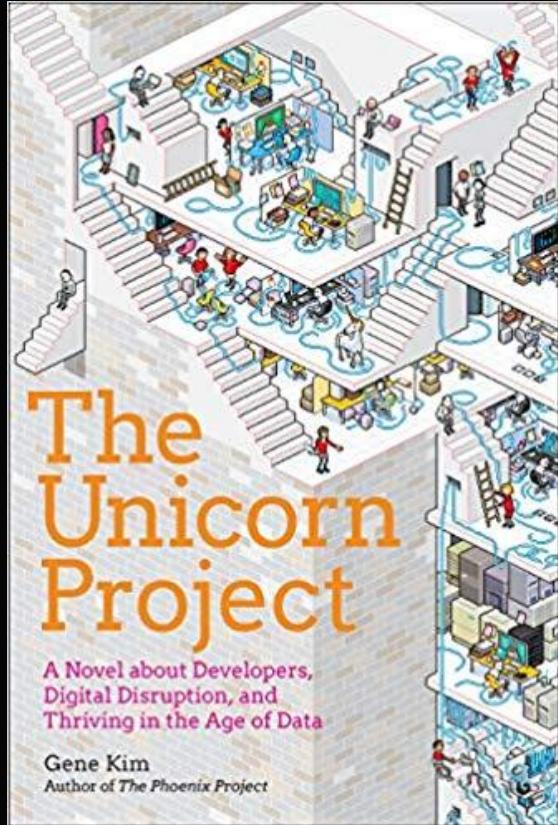
Debts - Impediments to Progress



DevOps for Defense Book Club



Sponsored by:



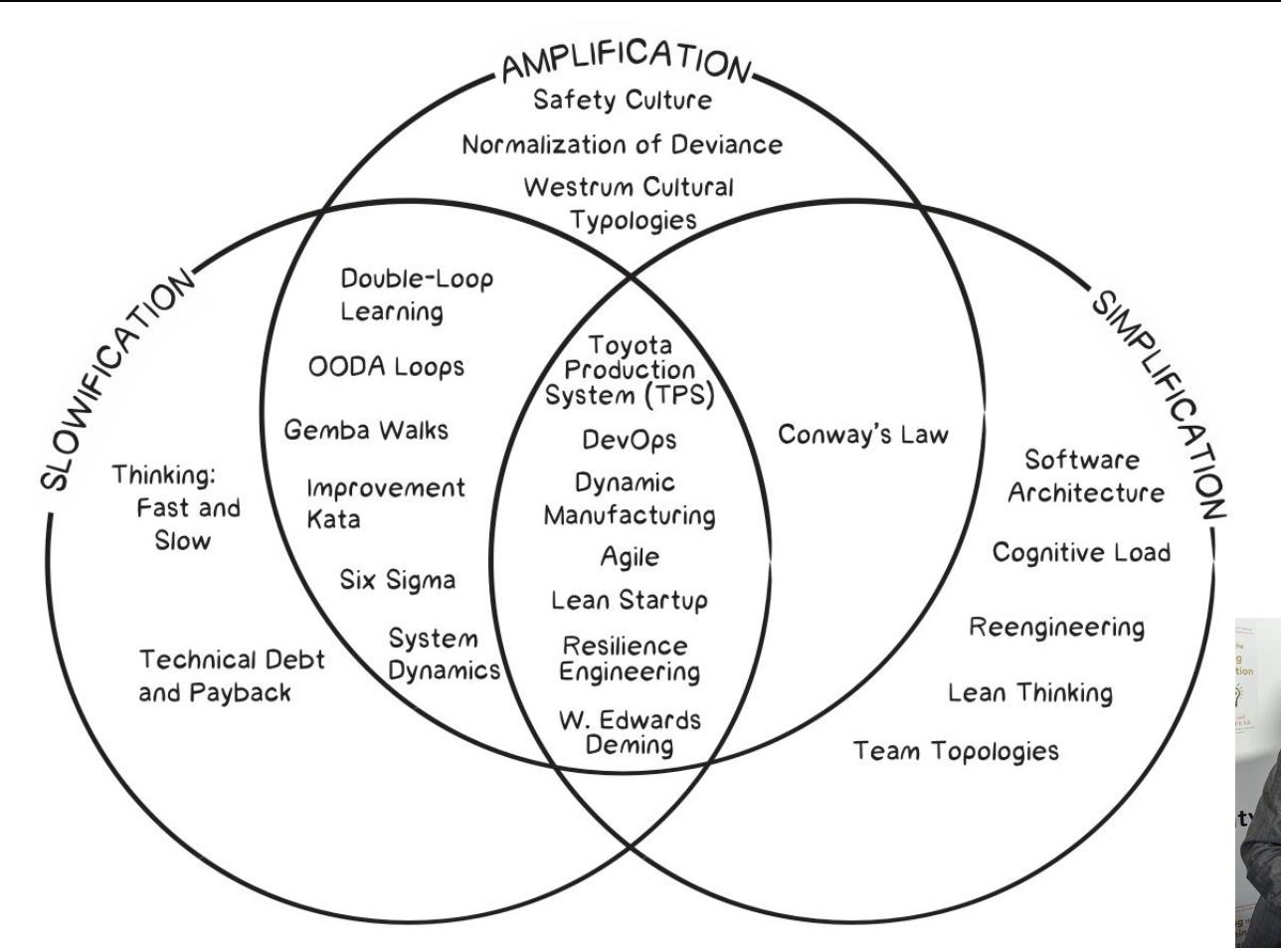
The Unicorn Project
By Gene Kim
Released Nov 26th, 2019



The 5 Ideals:

1. Locality & Simplicity
2. Focus, Flow, & Joy
3. Improvement of Daily Work
4. Psychological Safety
5. Customer Focus

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LIBERATING OUR COLLECTIVE GREATNESS THROUGH
SLOWIFICATION, SIMPLIFICATION, AND AMPLIFICATION

Wiring the Winning Organization

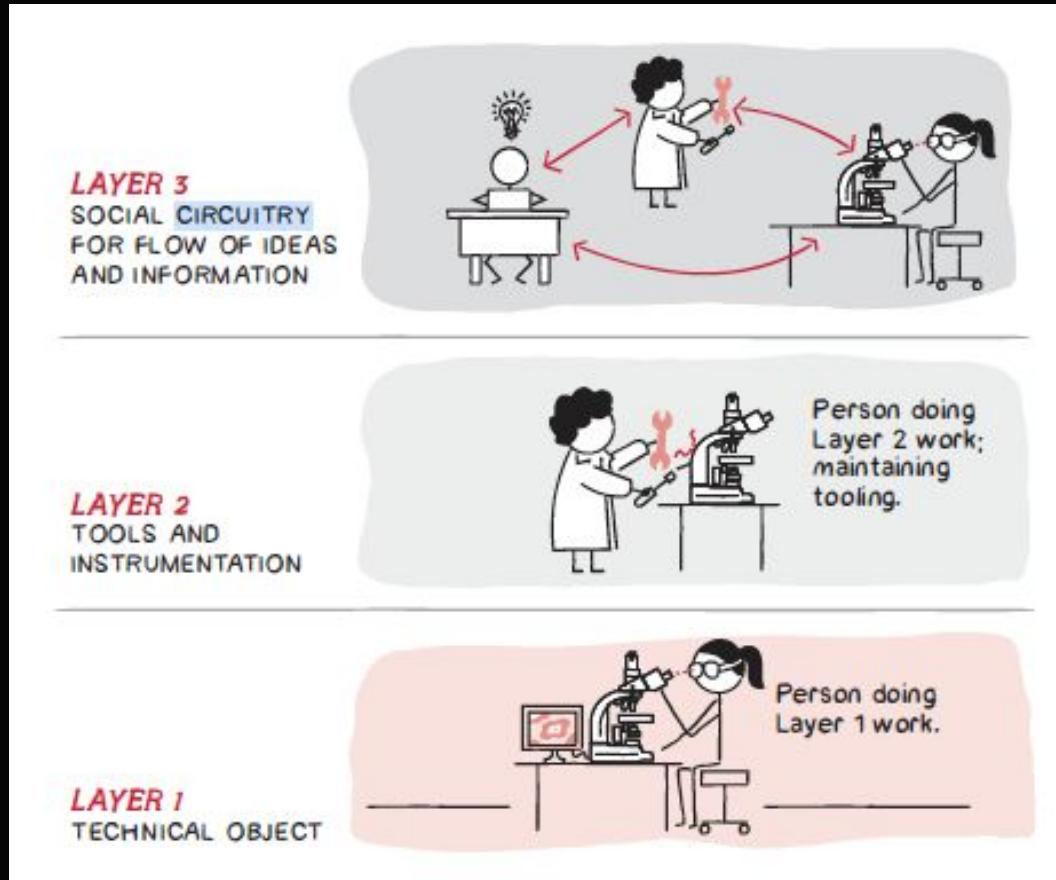


GENE KIM and
STEVEN J. SPEAR

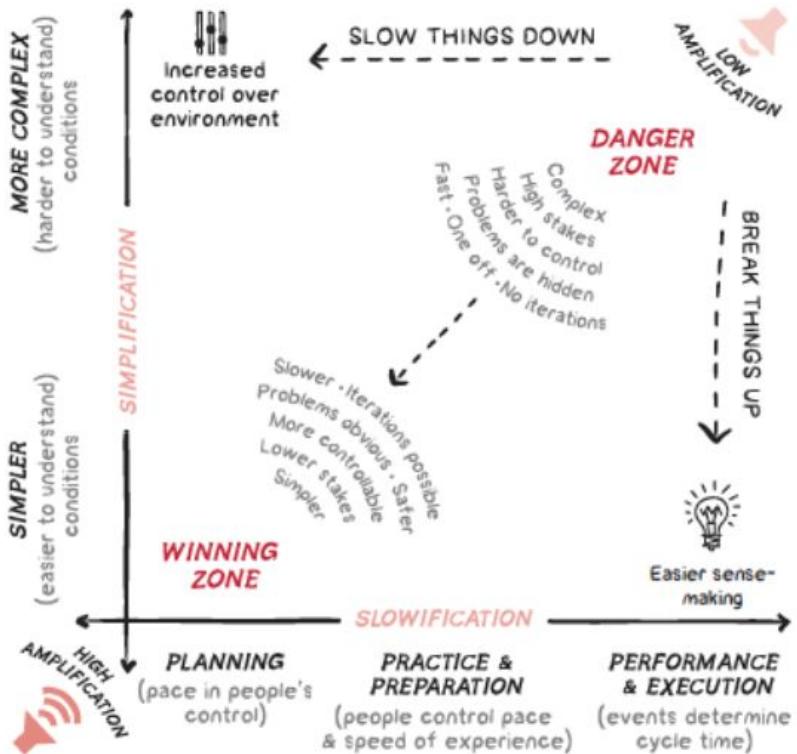
*Foreword by ADM John Richardson, US Navy (Retired)
former Chief of Naval Operations*



Three Layers of Work



“Danger zone” vs. “Winning Zone”



- **Slowification**
 - Solve problems not in production, but in pre-production
 - Pause the system, if necessary
- **Simplification**
 - Smaller coherent units that can work independently
 - Reduce coupling where you can
- **Amplification**
 - Reduce noise in the system, so you can amplify small problems, so you can treat them like large problems

Implementing DevOps Practices Requires
Some Learning and Some Work...

But It's Not That Hard Once You Start...

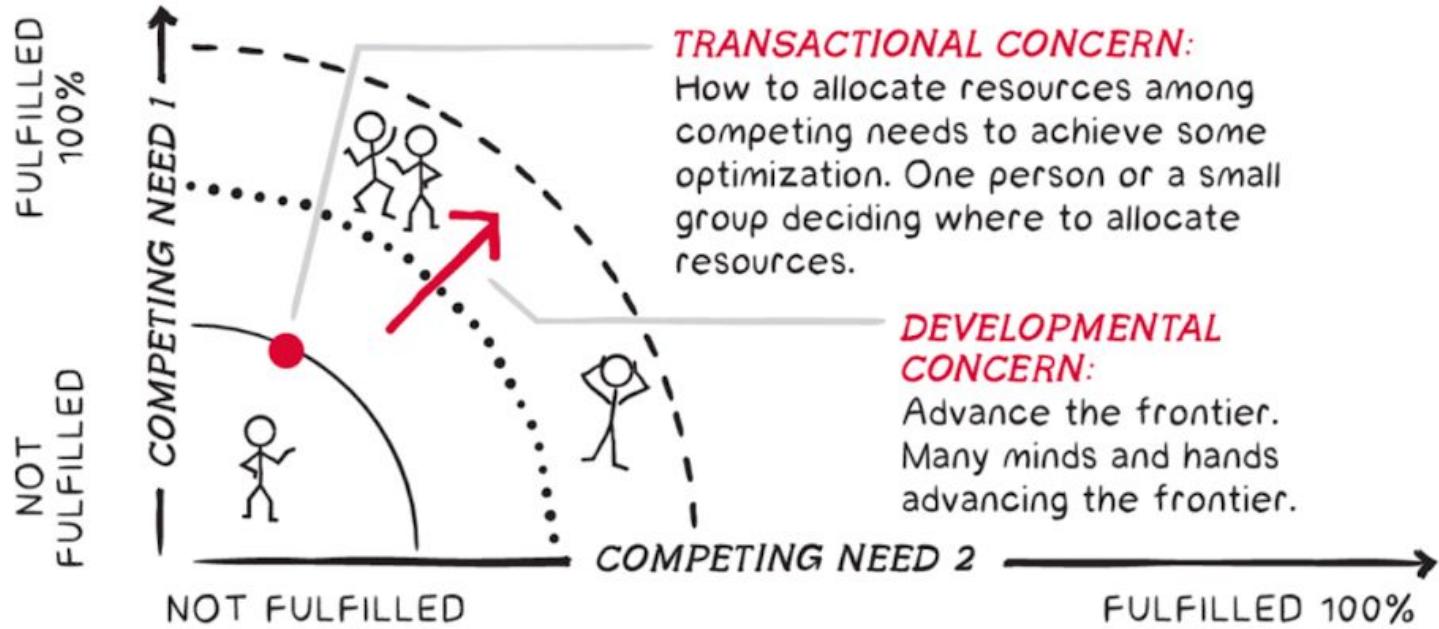
The Hardest Part is Choosing to Do It.

Transactional vs. Developmental

	Question	Transactional Orientation	Developmental Orientation
a	What limits our ability to create and deliver value?	Scarce resources and the limited alternatives for which they can be used.	Useful understanding of resources' best possible use: the range of alternatives that might be pursued and how to use the resources most effectively in pursuit of those possibilities.
b	What actions can we take to meet our goals?	"Optimization": allocation of scarce resources to best possible use (by transaction [in a market] or reassignment [by algorithm]).	Slowification, simplification, and amplification make it quicker and easier to solve difficult problems better.
c	What are we trying to achieve?	Achieve some optimal point on the frontier of what is achievable, given the resources available.	Advance the frontier of what is achievable by bringing new and useful knowledge into practice.

Transactional vs. Developmental

	Question	Transactional Orientation	Developmental Orientation
d	What is primary and what has to adapt?	The system is primary, and people have to adapt to it.	The people are primary, and the system has to be adapted to fit people and the work they have to do individually and collaboratively, so more value is created quicker and easier.
e	What is needed to increase output?	More resources.	Better problem-solving.



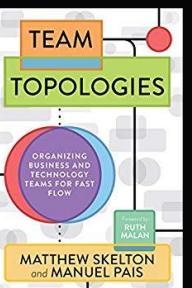
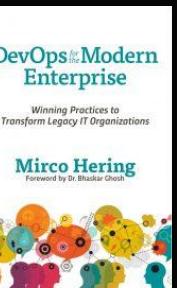
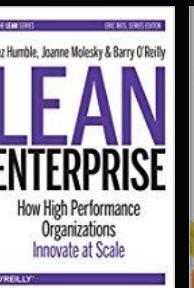
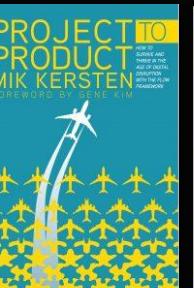
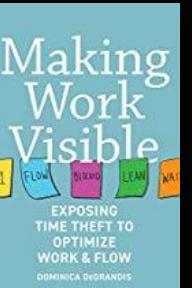
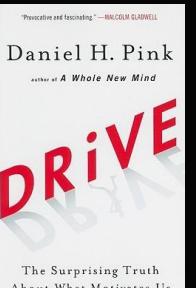
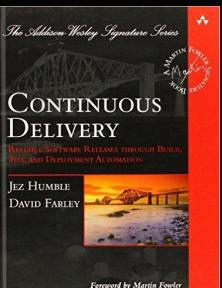
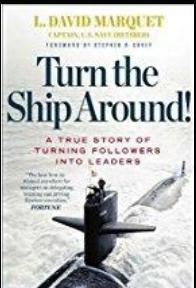
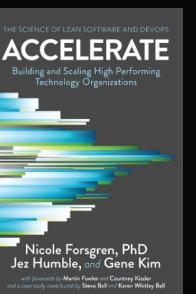
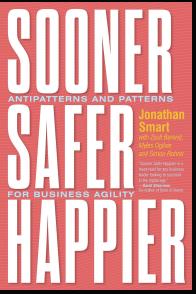
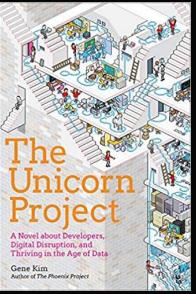
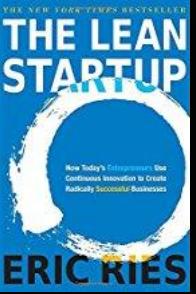
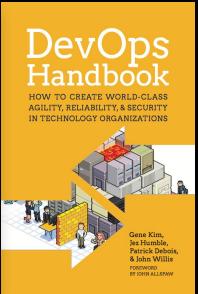
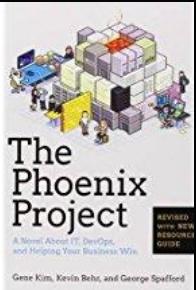
Optimizing on the frontier or advancing it (collaboratively).

Become the Transformational Leader for Your Team!

DevOps Resources

<https://devopsfordefense.org/resources/>

Books / Publications:



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<https://github.com/jondavid-black/DevOpsForDefense>
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