

# DevOps & Software Delivery in a Global Pandemic







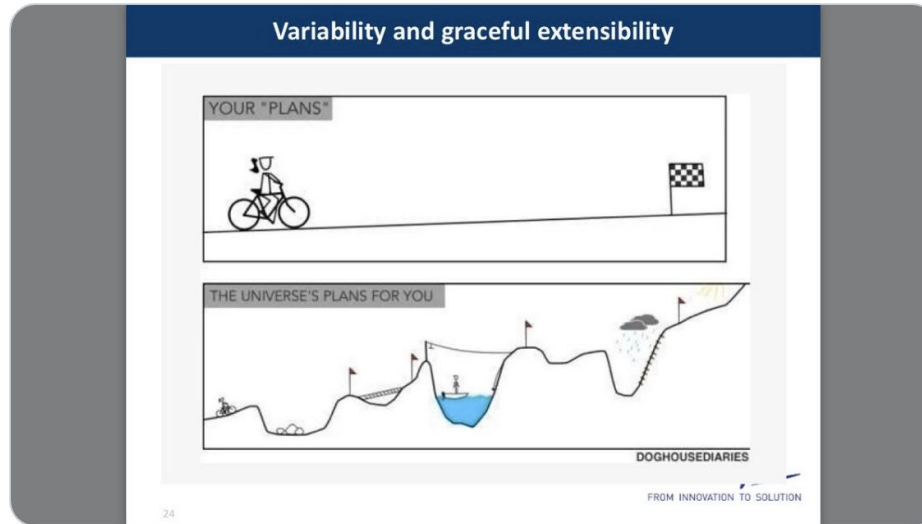
**John Allspaw**

@allspaw

Normal 0%



## Work-as-imagined versus work-as-done



3:00 AM · Apr 28, 2016 · Twitter for iPhone

*performance described*  
**VS**  
*performance derived*



**Jeremy Meiss**  
Director, DevRel & Community



 @IAmJerdog

**2 million**

jobs/day

**44,000+**

orgs

*\* 40k in 2019*

**160,000+**

projects

*\* 150k in 2019*

**1,000x**

Larger than surveys

# Four classic metrics

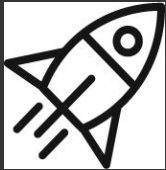
Deployment  
frequency

Lead time  
to change

Change failure  
rate

Recovery  
from failure  
time

# CI/CD Benchmarks for high performance



**Throughput**

**At will**



**Duration**

**<10 minutes**



**Success Rate**

**> 90%**



**Mean Time to Recovery**

**<1 hour**



# The Data



**Photo by: Matthew Henry**

# Throughput

Percentile	2020 Value	2019 Value
5p	0.03	0.03
50p	0.70	0.80
90p	16.03	13.00
95p	32.125	25.47
Mean	8.22	5.76

***Most teams are not  
deploying dozens of times  
per day***



Image by Pawan Kolhe from Pixabay



# Duration

Percentile	2020 Value	2019 Value
5p	12 sec	10 sec
50p	3.96 min	3.38 min
90p	21.35 min	19.18 min
95p	34.01 min	31.73 min
Mean	24.6 min	26.76 min



Photo by Lukas from Pexels

# Success Rate

Percentile	2020 Value	2019 Value
5p	0%	0%
50p	61%	60%
90p	100%	100%
95p	100%	100%
Mean	54%	54%





*Photo by Brett Sayles from Pexels*

# Recovery Time

Percentile	2020 Value	2019 Value
5p	2.06 min	2.83 min
50p	55.11 min	52.5 min
90p	39 hours	47 hours
95p	3.4 days	3.93 days
Mean	14.85 hours	16.61 hours

# Recovery Time

Percentile	2020 Value	2019 Value
5p	2.06 min	2.83 min
50p	55.11 min	52.5 min
90p	39 hours	47 hours
95p	3.4 days	3.93 days
Mean	14.85 hours	16.61 hours

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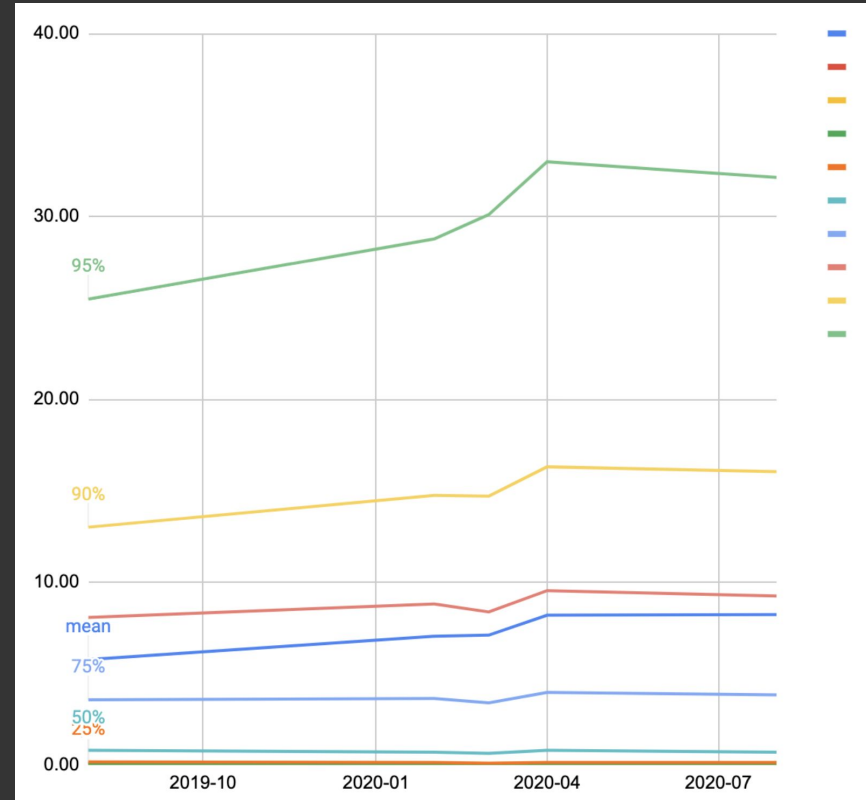
# The Insight



2020 has been  
a year.

# Throughput

# Throughput in a global pandemic

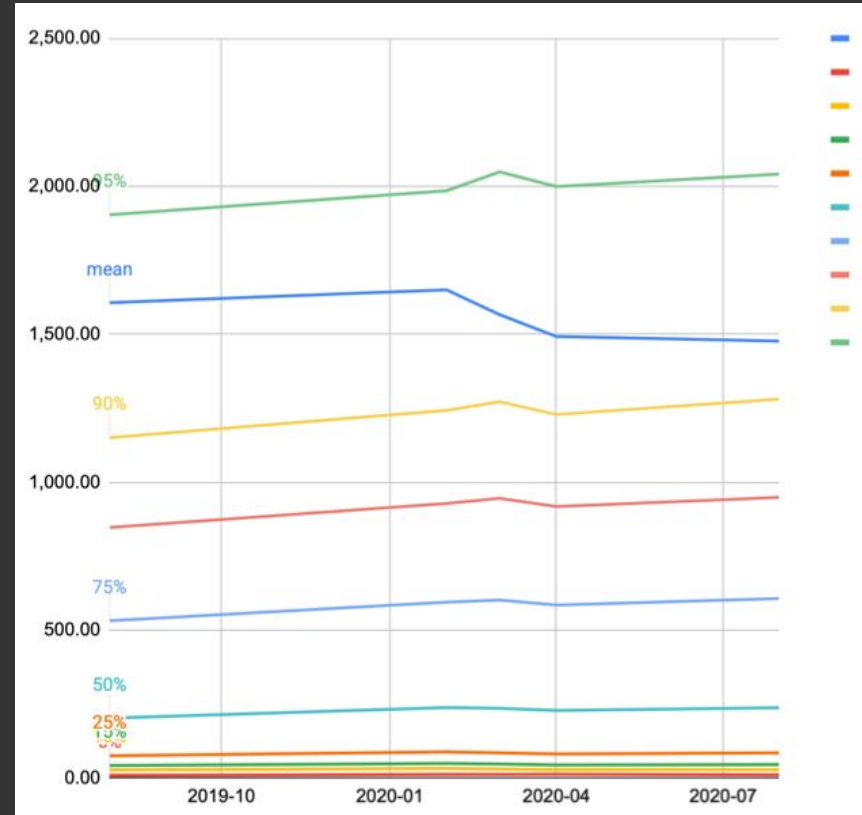




**Peak Throughput was in April 2020**

# Duration

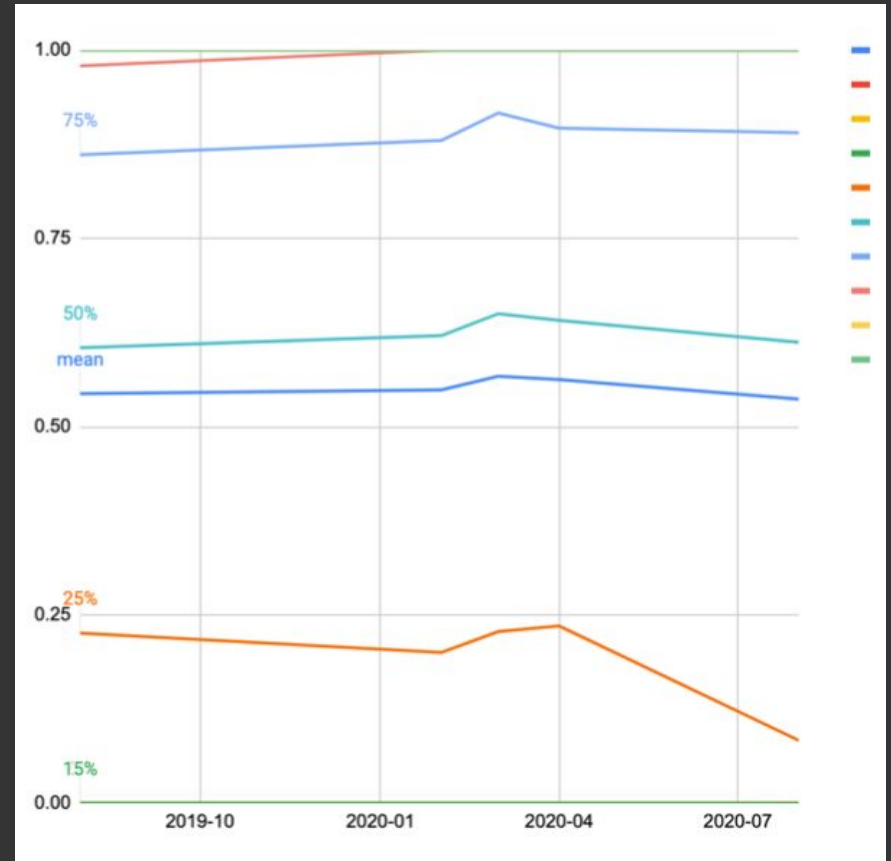
# Duration in a global pandemic



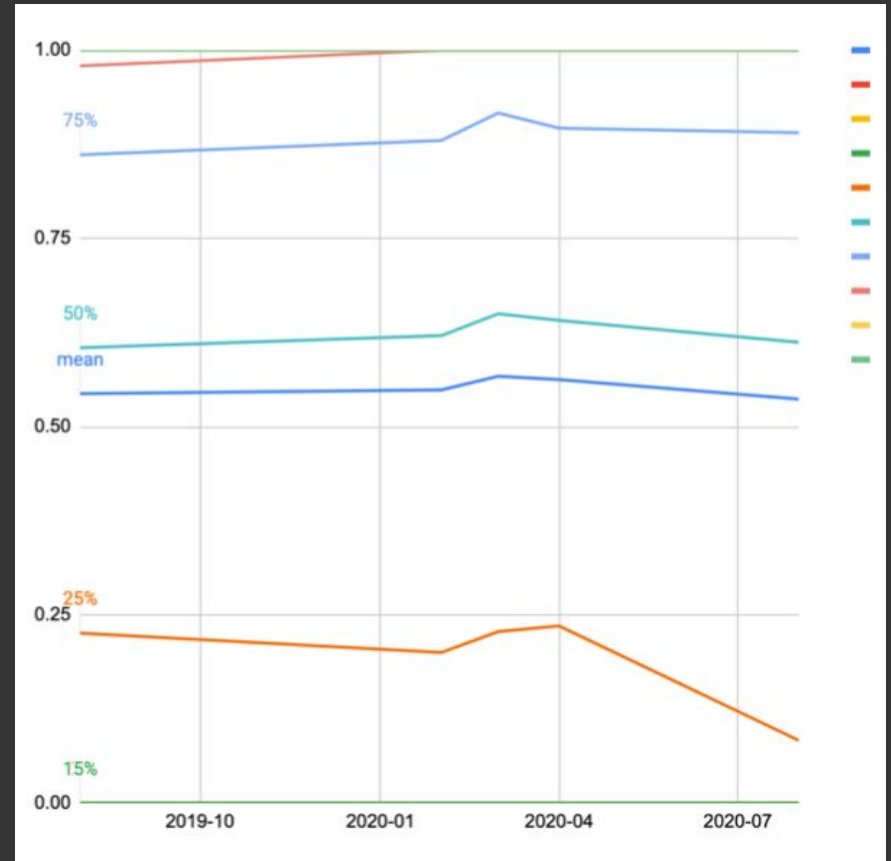
**Hypothesis: more tests written in March, driving up Duration. In April, a concerted effort on optimization**

# Success rate

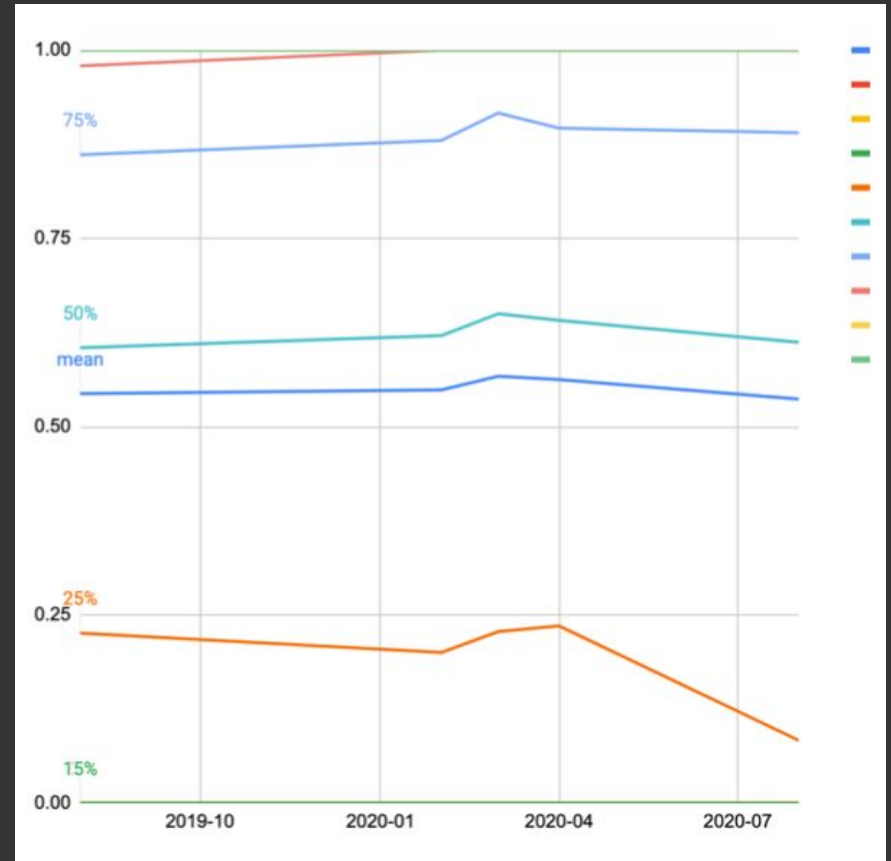
# Success rate in a global pandemic



# Success rate in a global pandemic



# Success rate in a global pandemic

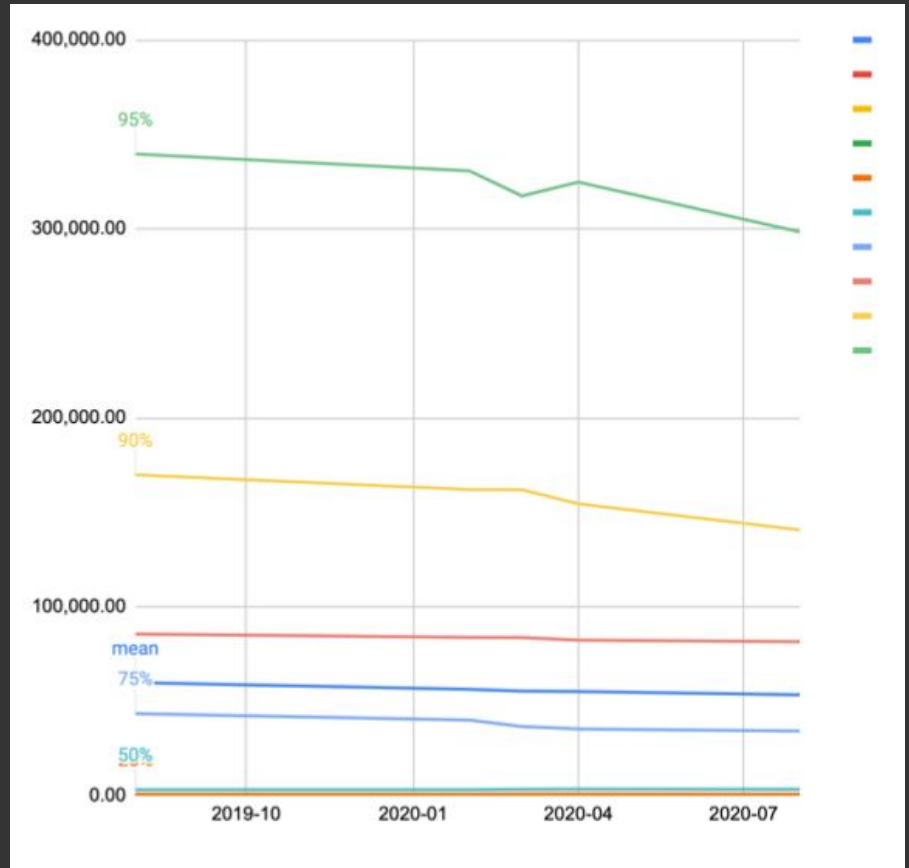




**Hypothesis: people working hard  
on core business stability**

# Recovery Time

# Recovery time in a global pandemic



**Hypothesis: few distractions\*  
working at home**

# Important to set targets

	Median CircleCI Developer	Suggested Benchmarks
<b>Throughput</b> The average number of workflow runs per day	0.7 times/day	Merge on any pull request
<b>Duration</b> The average length of time for a workflow to run	< 4 minutes	5-10 minutes
<b>Mean time to recovery</b> The average time between failures & their next success	< 56 minutes	Under 1 hour
<b>Success rate</b> The number of successful runs / the total number of runs over a period of time	80% for default branch	90% or better on default branch

Things that make you go 🤔

# Branch information

No significant change in default  
branch from **master**... yet.



**Success Rate** on default branch  
higher than on non-default

**Duration** on default branches *faster*  
at every percentile

**Recovery Time** lower on default  
branches at every percentile

**What development  
practices definitively work?**

**Success Rate** does not correlate  
with company size

**Duration** is longest  
for teams of one

**Recovery Time** decreases with  
increased team size (up to 200)

Performance is better  
with  $>1$  contributor



**Software is  
collaborative**

# Language by Throughput

- |               |                      |
|---------------|----------------------|
| 1. Ruby       | 11. PHP              |
| 2. TypeScript | 12. Java             |
| 3. Go         | 13. C#               |
| 4. Python     | 14. Jupyter Notebook |
| 5. Kotlin     | 15. Shell            |
| 6. Elixir     | 16. Vue              |
| 7. Swift      | 17. C++              |
| 8. HCL        | 18. HTML             |
| 9. JavaScript | 19. CSS              |
| 10. TSQL      | 20. Dockerfile       |

# Language by Success Rate

- |                |                      |
|----------------|----------------------|
| 1. Vue         | 11. Elixir           |
| 2. CSS         | 12. PHP              |
| 3. Shell       | 13. Jupyter Notebook |
| 4. Dockerfile  | 14. Python           |
| 5. TSQL        | 15. Ruby             |
| 6. HTML        | 16. Java             |
| 7. HCL         | 17. Kotlin           |
| 8. Go          | 18. C#               |
| 9. TypeScript  | 19. C++              |
| 10. JavaScript | 20. Swift            |

# Language by fastest TTR

- |               |                      |
|---------------|----------------------|
| 1. Go         | 11. Vue              |
| 2. JavaScript | 12. Jupyter Notebook |
| 3. Elixir     | 13. Kotlin           |
| 4. HCL        | 14. Java             |
| 5. Shell      | 15. Scala            |
| 6. Python     | 16. Ruby             |
| 7. TypeScript | 17. PHP              |
| 8. CSS        | 18. TSQL             |
| 9. C#         | 19. Swift            |
| 10. HTML      | 20. C++              |

# Language by shortest duration

- |                     |                |
|---------------------|----------------|
| 1. Shell            | 11. PHP        |
| 2. HCL              | 12. TypeScript |
| 3. CSS              | 13. Java       |
| 4. HTML             | 14. Elixir     |
| 5. Gherkin          | 15. TSQL       |
| 6. JavaScript       | 16. Kotlin     |
| 7. Vue              | 17. Scala      |
| 8. Go               | 18. Ruby       |
| 9. Jupyter Notebook | 19. C++        |
| 10. Python          | 20. Swift      |

**“Don’t deploy on Friday” is  
not a thing.**

# “Don’t Deploy on Friday” is not a thing

- 70% less **Throughput** on weekends
- 11% less **Throughput** on Friday (UTC)
- 9% less **Throughput** on Monday (UTC)

# Full Report



<https://circle.ci/ssd2020>





# Thank you.

For feedback and swag: [circle.ci/jeremy](https://circle.ci/jeremy)



Timeline.jerdog.me



IAmJerdog



jerdog



/in/jeremymeiss



 @IAmJerdog