If You Don’t Know Where You’re Going, It Doesn’t Matter How Fast You Get There

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Getting Better – and Measuring Performance

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Common Mistakes

- Outputs vs. Outcomes
- Individual/local vs. Team/global
- Some common examples:
  - Lines of code
  - Velocity
  - Utilization

Common Mistakes: Lines of Code

- More is better?
  - Bloated software
  - Higher maintenance costs
  - Higher cost of change
- Less is better?
  - Cryptic code that no one can read
- Ideal: solve business problems with most efficient code

Common Mistakes: Velocity

- Agile: problems are broken down into stories, which are assigned “points” of estimated effort to complete
- At end of sprint, total points signed off by customer is recorded = velocity
- Velocity is a capacity planning tool. NOT a productivity tool.
- Why doesn’t this work for productivity?
  - Velocity is a relative measure, not absolute. So: bad for comparing teams
  - Gaming by inflating estimates
  - Focus on team completion at the expense of collaboration (a global goal)

Common Mistakes: Utilization

- Utilization is only good up to a point
- Higher utilization is better?
  - High utilization doesn't allow slack for unplanned work
  - Queue theory: as utilization approaches 100%, lead times approach infinity
  - Once you hit higher and higher levels of utilization (a poor goal of productivity), teams will take longer and longer to get work done


But no matter how quickly
you improve performance…
where are you going?

DevOps is good for Technology

Software delivery performance

- Deploy frequency (when business demands)
- Lead Time for Changes
- Mean Time to Recover (MTTR)
- Change Fail Rate

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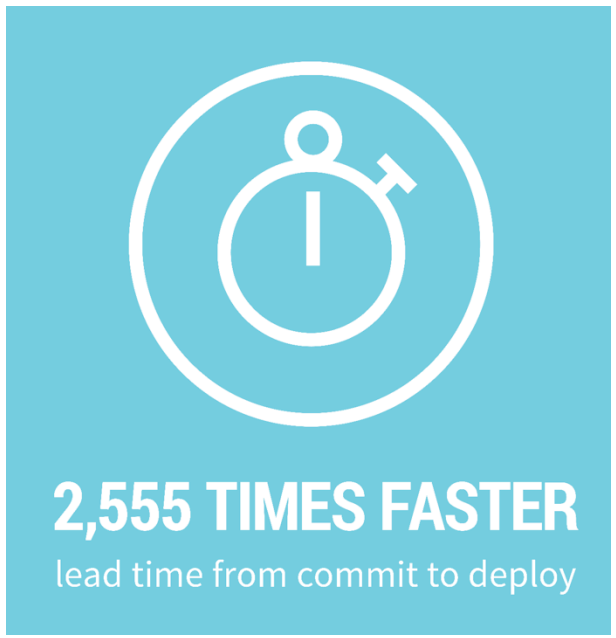
Key Findings - Elite Performers



Software Delivery Performance is comprised of **throughput** and **stability**,

and **both are possible without tradeoffs**

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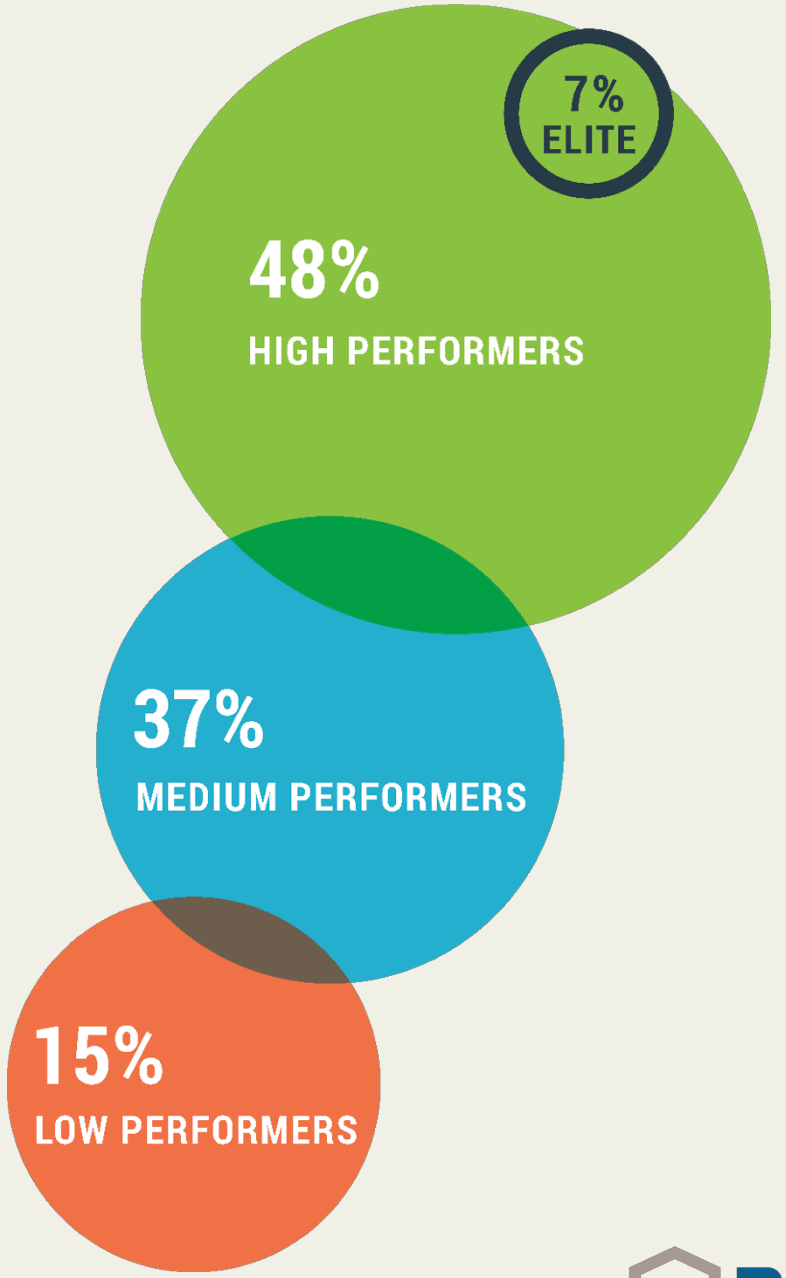
Elite Performers

Proportion of high performers has grown YoY, but the bar for excellence remains high

Highest (elite) performers are still able to optimize for **throughput and stability**



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New 2018 Performance Benchmarks

Aspect of Software Delivery Performance	Elite[a]	High	Medium	Low
Deployment frequency For the primary application or service you work on, how often does your organization deploy code?	On-demand (multiple deploys per day)	Between once per hour and once per day	Between once per week and once per month	Between once per week and once per month
Lead time for changes For the primary application or service you work on, what is your lead time for changes (i.e., how long does it take to go from code commit to code successfully running in production)?	Less than one hour	Between one day and one week	Between one week and one month[b]	Between one month and six months[b]
Time to restore service For the primary application or service you work on, how long does it generally take to restore service when a service incident occurs (e.g., unplanned outage, service impairment)?	Less than one hour	Less than one day	Less than one day	Between one week and one month
Change failure rate For the primary application or service you work on, what percentage of changes results either in degraded service or subsequently requires remediation (e.g., leads to service impairment, service outage, requires a hotfix, rollback, fix forward, patch)?	0-15%	0-15%	0-15%	46-60%

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SOFTWARE DEVELOPMENT

SOFTWARE DEPLOYMENT

SERVICE OPERATION

Lead Time

Change Fail

Availability

Deployment Frequency

Time to Restore

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Availability Matters

- Elite performers are 3.55 times more likely to have good availability practices
- Throughput and Stability **and Availability** predict Organizational Performance outcomes better

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Maturity Models

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Maturity Models *are dumb*

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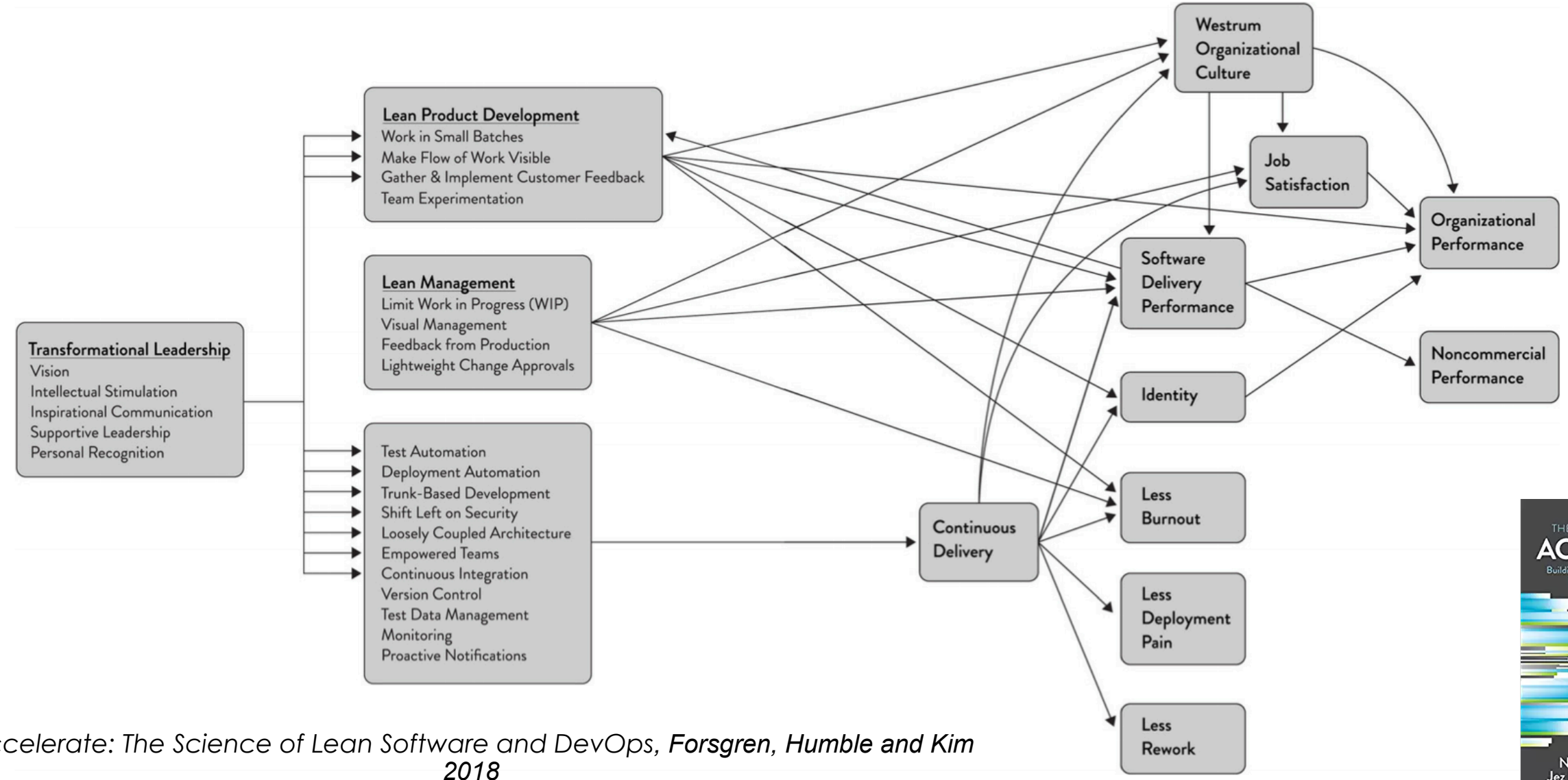
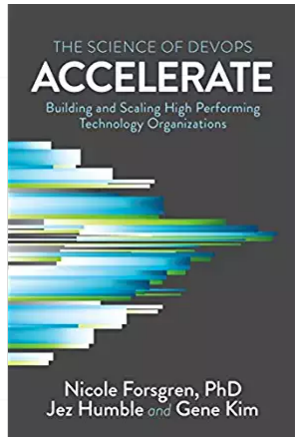
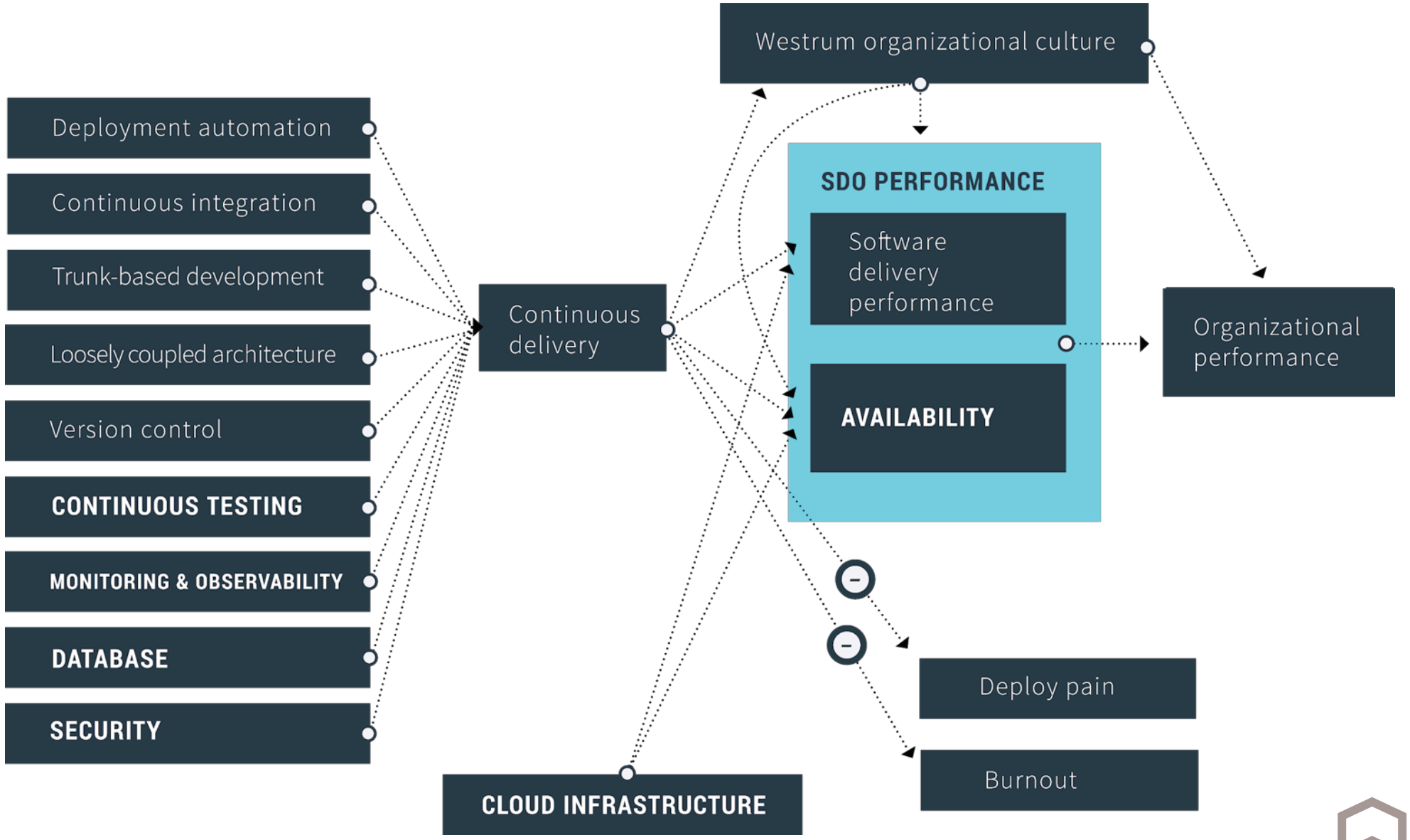
capabilities that drive high performance





Accelerate: The Science of Lean Software and DevOps, ***Forsgren, Humble and Kim 2018***

2018: new findings in technical practices



Don’t Forget the Database

Integrating database work into software delivery **positively contributes to SDO performance**

Integrating database practices look much like integrating ops work in early days: communication, config management, including teams, visibility

Teams could think about this like “shifting left”

monitoring and observability

Teams with a comprehensive monitoring and observability solution were **1.3 times more likely to be an elite performer**.

Having a monitoring and observability solution **positively contributed to SDO performance**.

Fun stats fact: monitoring and observability load together.

MONITORING
is tooling or a technical solution that allows teams to watch and understand the state of their systems and is based on gathering predefined sets of metrics or logs.

OBSERVABILITY
is tooling or a technical solution that allows teams to actively debug their system and explore properties and patterns they have not defined in advance.

Cloud infrastructure helps

Cloud infrastructure helps *but only if you do it right*

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5 Essential Characteristics (NIST)

- **On-demand self-service.** NO TICKETS

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- **Measured service**. AUTO RESOURCE OPTIMIZATION

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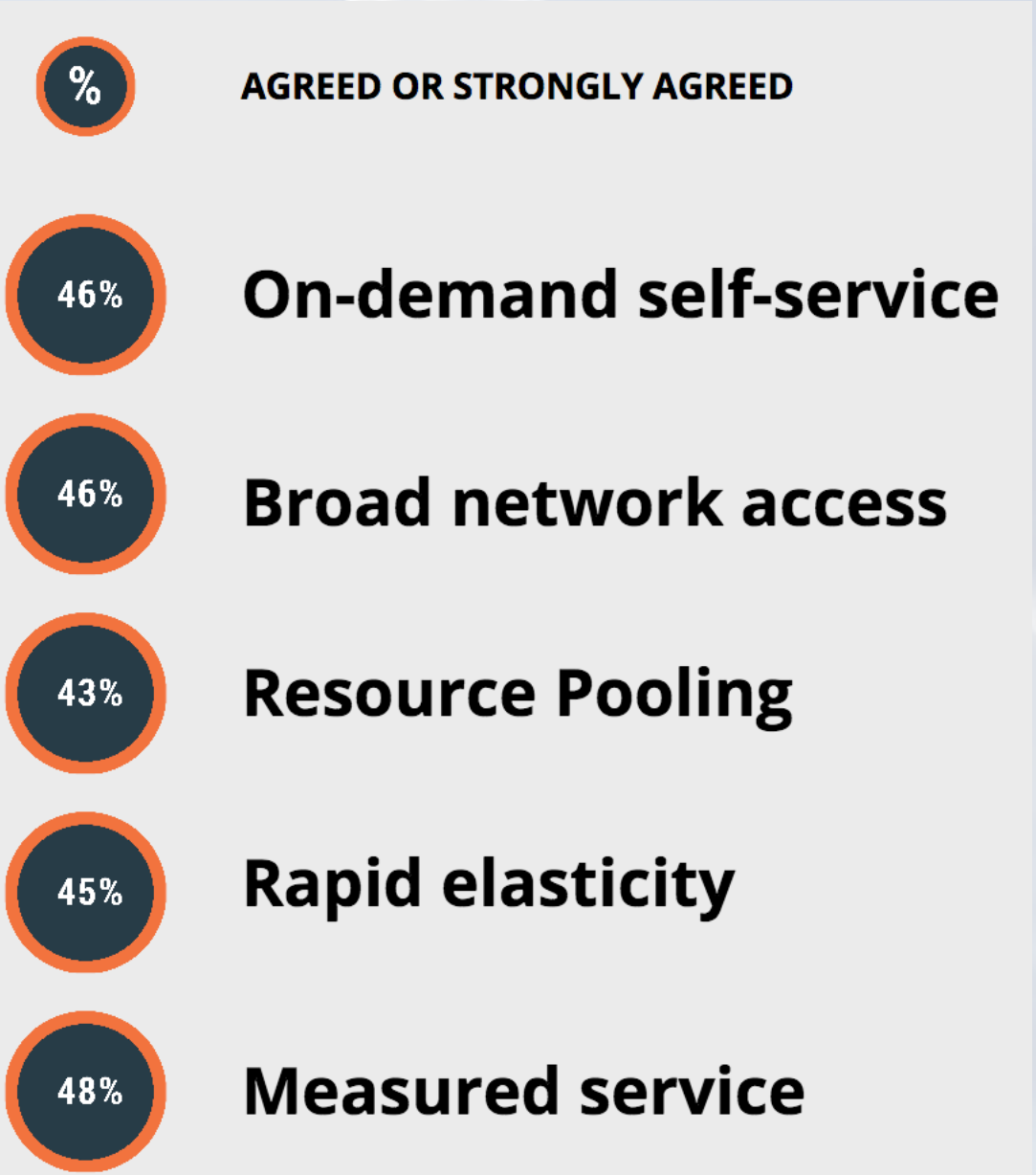
Only 22%



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5 Essential Characteristics (NIST)

23 TIMES
MORE LIKELY TO BE AN ELITE PERFORMER

%	AGREED OR STRONGLY AGREED
46%	On-demand self-service
46%	Broad network access
43%	Resource Pooling
45%	Rapid elasticity
48%	Measured service

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Open source is GOOD

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OSS is correlated with SDO Performance

- Elite performers are **1.75x more likely** to make **extensive use of open source** components, libraries, and platforms
- Elite performers are **1.5x more likely** to be **expanding their use of OSS**

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Outsourcing is BAD

Outsourcing drives poor SDO performance

- Low performers are **3.9x more likely** to use functional outsourcing (dev, test & QA or ops)
- The costs of batching up work often exceed any cost savings from outsourcing

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Slow and overly cautious is BAD

DON'T: Go Slow Misguided Performers

Some teams optimize for caution: low deploy frequency, high lead times, and low deployment failure

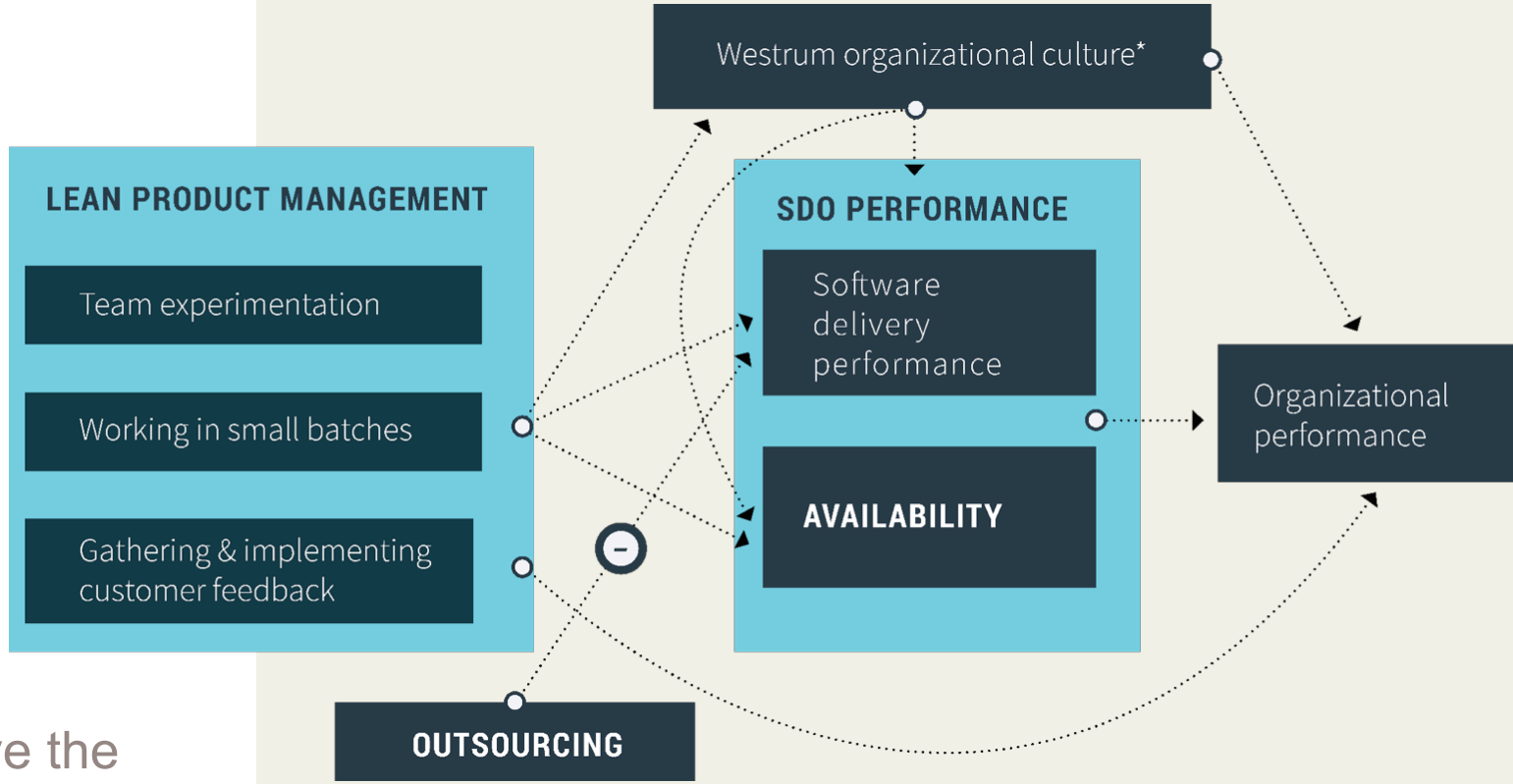
That same group also reports the **longest times to restore service** for outages (1-6 months!)

Large-batch changes add complexity & no one thinks it will happen to them, but 5% of teams **suffer the consequences**

DON'T: Use outsourcing

Low performing teams are **3.9X more likely** to use functional outsourcing than elite teams

Elite teams **rarely adopt** functional outsourcing



Misguided performers have the **highest use of outsourcing** of all groups

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We can influence culture


WORKED FINE IN DEV
38
OPS PROBLEM NOW
memegenerator.net

Westrum organizational culture

Pathological (Power-oriented)	Bureaucratic (Rule-oriented)	Generative (Performance-oriented)
Low cooperation	Modest cooperation	High cooperation
Messengers “shot”	Messengers neglected	Messengers trained
Responsibilities shirked	Narrow responsibilities	Risks are shared
Bridging discouraged	Bridging tolerated	Bridging encouraged
Failure leads to scapegoating	Failure leads to justice	Failure leads to inquiry
Novelty crushed	Novelty leads to problems	Novelty implemented

How to influence culture

- Smart investments in tech and practice – changing our work changes our culture
- ALSO!
  - Autonomy, voice and trust
  - Learning climate and retrospectives

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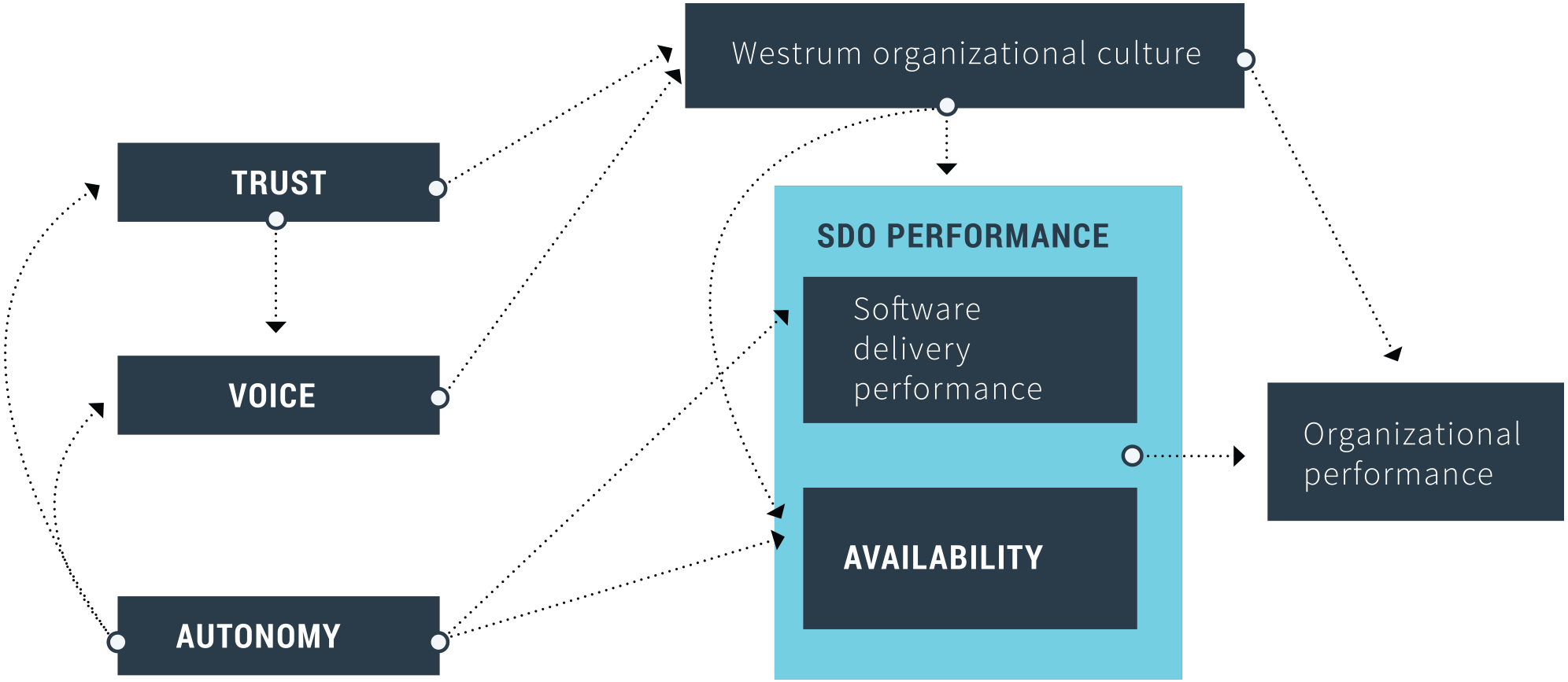
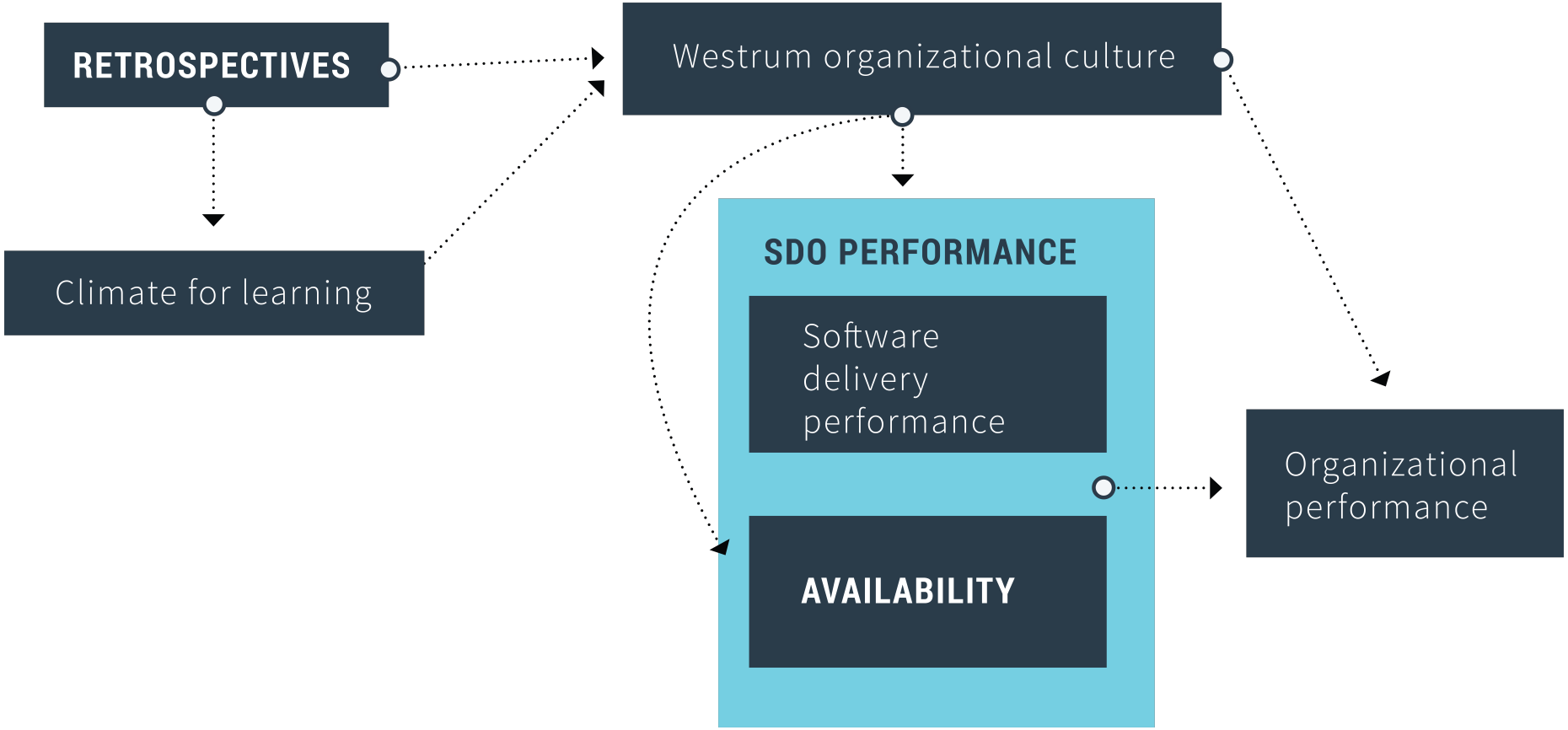

Westrum organizational culture
TRUST
VOICE
AUTONOMY
SDO PERFORMANCE
Software delivery performance
AVAILABILITY
Organizational performance


RETROSPECTIVES
Climate for learning
Westrum organizational culture
SDO PERFORMANCE
Software delivery performance
AVAILABILITY
Organizational performance

Some of our other favorite data findings!

Some of my other favorite data findings!

- Change advisory boards are **useless***
- Industry **doesn’t matter**
- Integration times and branch lifetimes **lasting hours are better than days**

TL;DR

- Technology matters
- Cloud works*
- Good (OSS) and bad (outsourcing)
- We can influence culture

Want the latest goodness?

2018

Accelerate:

State of DevOps

Strategies for a New Economy

Presented by

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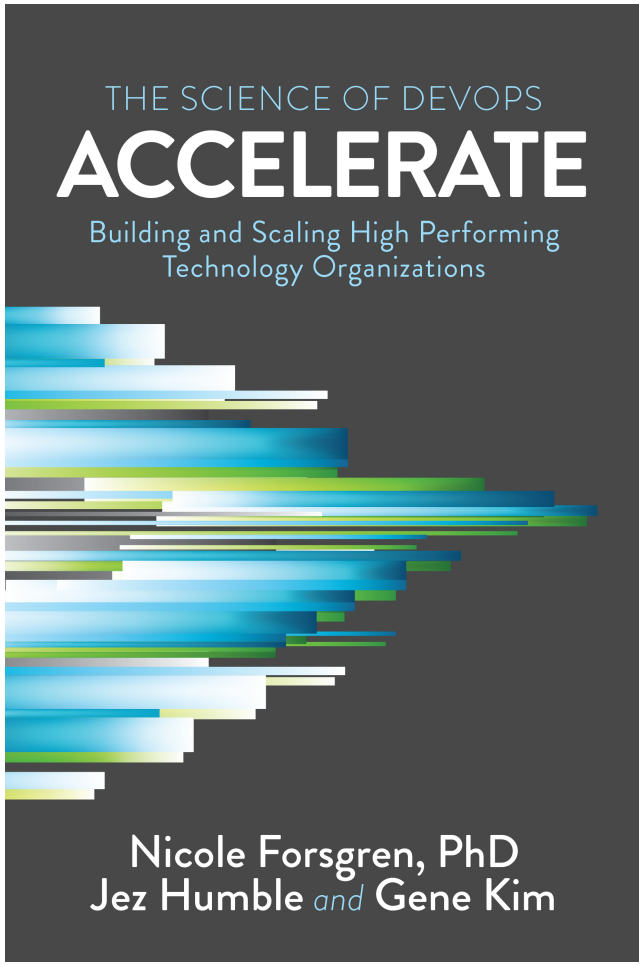
Deloitte. XebiaLabs Enterprise DevOps pagerduty redgate IT REV

cloudbees Datical sumologic TRICENTIS GitLab

HERE'S HOW TO GET IT



To receive the following:

- A link to the 2018 Accelerate State of DevOps Report
- A 93-page excerpt of ***Accelerate: The Science of DevOps***
- This presentation
- DORA's ROI whitepaper: Forecasting the Value of DevOps Transformations
- Metrics Guidance whitepaper
- My ACM Queue article on DevOps Metrics with Mik Kersten: Your Biggest Mistake Might Be Collecting the Wrong Data

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