

DevOps: Next

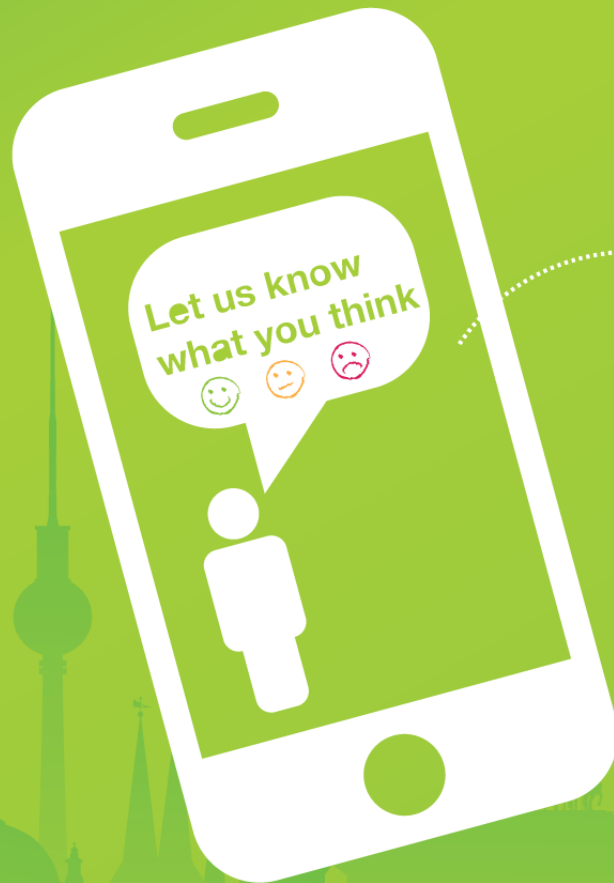
Nicole Forsgren, PhD

**Director of Organizational Performance & Analytics, Chef
Research Affiliate, Clemson University**



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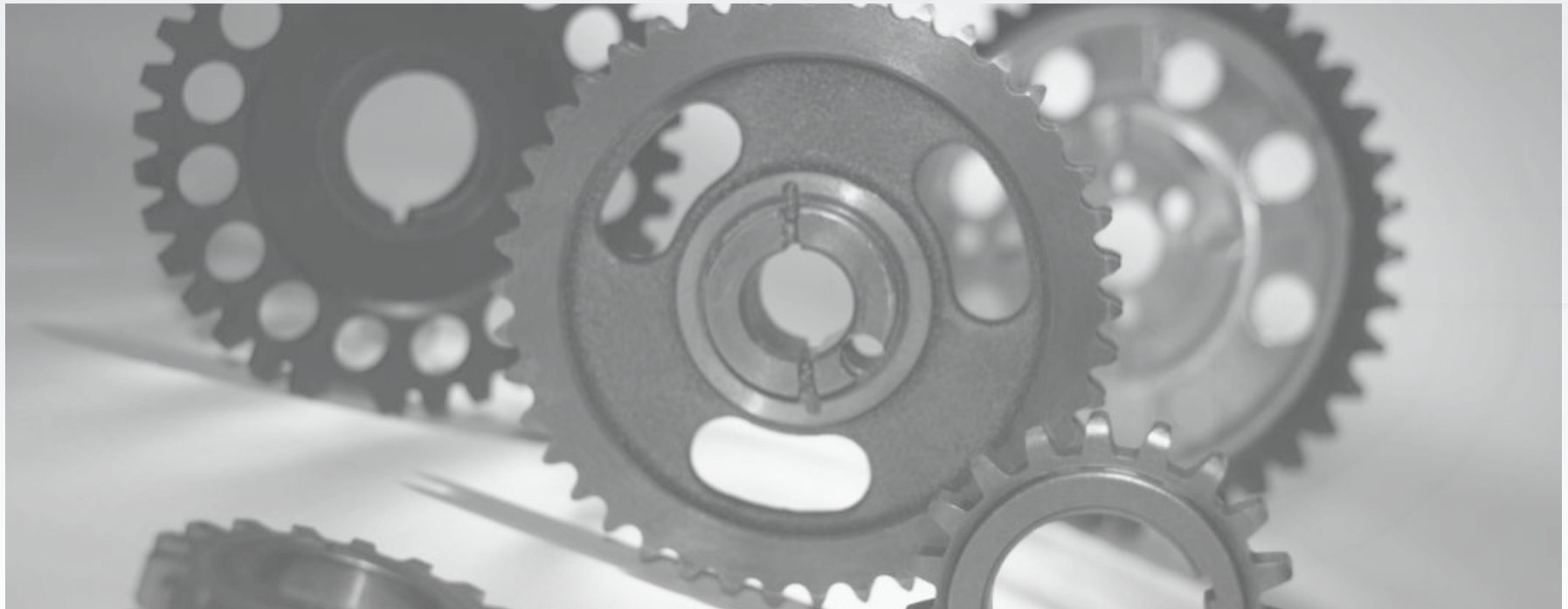
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DevOps is good for IT performance

and this IT performance translates

DevOps is good for organizations

That was then...

**10 deploys per day
Dev & ops cooperation at Flickr**

**John Allspaw & Paul Hammond
Velocity 2009**

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This is now...

Amazon Deployment Stats

(production & host environments only)

1,079

Max deploys
In a single hour

Every **11.6** seconds!

10,000

Mean # hosts receiving
Deploys simultaneously

30,000

Max # hosts receiving
Deploys simultaneously

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This is now...

Etsy Code Deployment

What once required **6-14 hours** and an “Army”

...Now takes **15 minutes** and **1 person**

30+

Deploys
per day
2013

50

Deploys per day
March 2014
QCon London

80-90

Deploys per day
April 2014
Chef Conf

2013 Mike Brittain, Continuous Deployment: The Dirty Details
3/2014 Daniel Schauenberg , Qcon London
4/2014 tweet @philkates

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Devops is good for **IT**

Measuring DevOps and ***IT Performance***

- Deploy frequency (Note: NOT delivery)
- Mean Time to Recover (MTTR)
- Lead Time for Changes

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High Performing DevOps teams

More *agile*

30x

More frequent
Deployments
(2015 and 2014)

200x

Faster lead times
than peers
(2015 and 2014)

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High Performing DevOps teams

More *reliable*

60x (2015)

3x (2014)

Change
Success
Rate

168x (2015)

48x (2014)

Faster
Mean time to recovery
(MTTR)

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DevOps promises – and delivers
More *throughput*
More *stability*

In tandem. Without the tradeoffs that
ITIL calls for.

Let's talk about what this means for us

High Performing DevOps teams

More *agile*

30x

More frequent
deployments

200x

Faster lead times

What does this mean for:

New content delivery

Value/savings around A/B testing

Value around speed to market

Compliance / regulatory

Security

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Evaluating well-designed and executed experiments that were designed to improve a key metric, **only about 1/3** were successful at improving the key metric!

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Online Experimentation at Microsoft, Kohavi et al <http://stanford.io/130uW6X>



High Performing DevOps teams

More *reliable*

60x

Fewer deploy
failures

168x

Faster MTTR

What does this mean for:

Value/savings around reliability

Value/savings around uptime

Compliance

Security

Reputation around compliance &
security

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NETFLIX

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Key Factors that Correlate with Each Component:

MTTR

Version control for *all* production artifacts
Monitoring

Lead time for changes

Version control for *all* production artifacts
Automated testing

Deployment Frequency

Version control for *all* production artifacts
Continuous Delivery

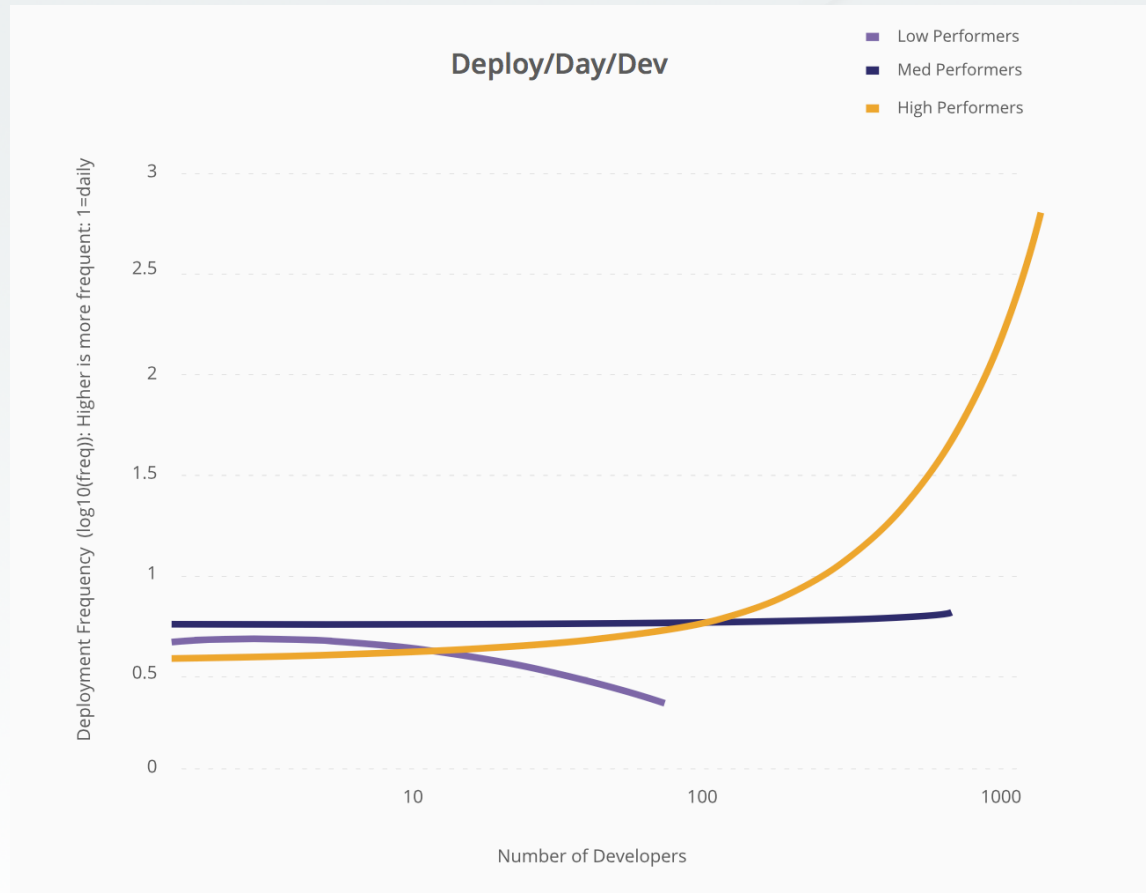
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Also Super Important:

Culture
Job satisfaction
Climate for learning

New research suggests the transformation is worth it



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DevOps is good for **organizations**

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High Performing IT organizations

2x

More likely to exceed
Profitability,
Market share, and
Productivity goals

50%

Higher market cap
growth over 3 years*

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Three main contributors to organizational performance

1. IT performance and strong *DevOps practices*
2. Organizational *culture* and climate for learning
3. Job satisfaction

Organizational Culture

Pathological <i>Power-oriented</i>	Bureaucratic <i>Rule-oriented</i>	Generative <i>Performance-oriented</i>
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

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15%

52%

33%



Intuit

“By installing a rampant innovation culture, we performed **165 experiments** in the peak three months of tax season.

Our business result? Conversion rate of the website is up **50%**. Employee result? Everyone loves it, because their new ideas can make it to market. ”

- Scott Cook, Intuit founder

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Amazon

“I think *building this culture is the key to innovation*. Creativity must flow from everywhere. Whether you are a summer intern or the CTO, any good idea must be able to seek an objective test, preferably a test that exposes the idea to real customers. Everyone must be able to *experiment*, *learn*, and *iterate*.”

- Greg Linden

Job Satisfaction

Top Correlates of Job Satisfaction

- ★ High-trust organizational culture
- ★ Climate of learning
- ★ Win-win relationships between ops, dev and infosec teams
- ★ Proactive monitoring and autoscaling
- ★ Use of version control for all production artifacts
- ★ Automated testing

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Job satisfaction is the **# 1 predictor** of organizational performance!

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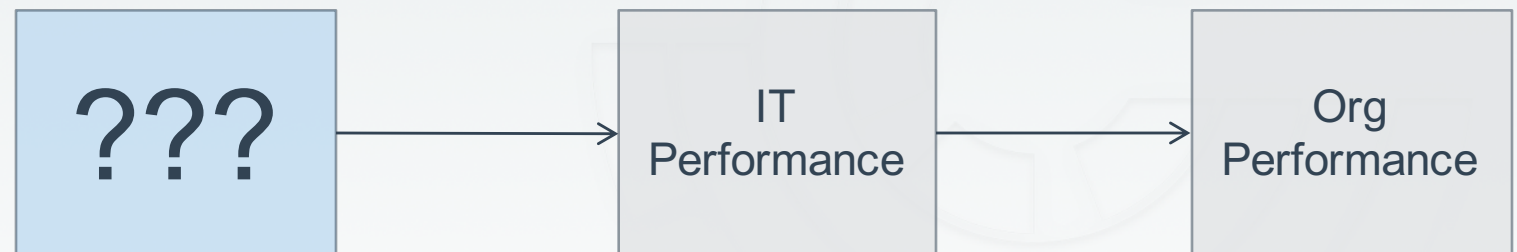


We know:

- IT Performance is comprised of throughput and stability, and **both are possible**
- IT Performance contributes to org performance (\$\$\$)
- **Culture is a key predictor** of both IT Performance and Organizational Performance
- Automation and tooling are **important**
- So:

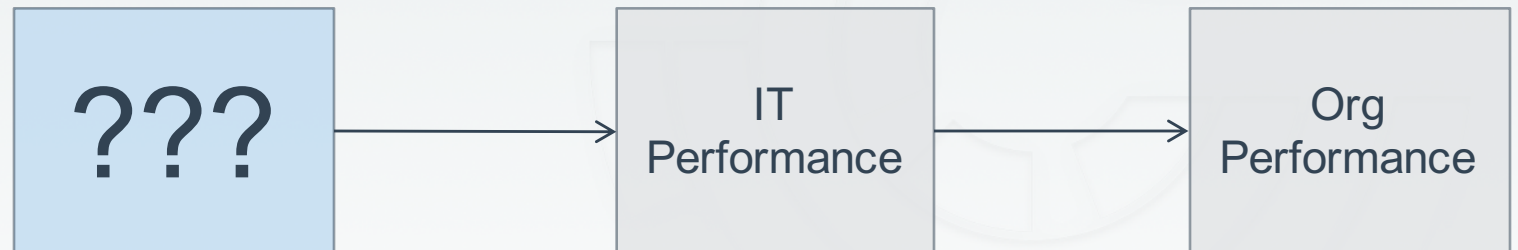
What drives IT and Organizational Performance?

But what *drives* IT Performance?

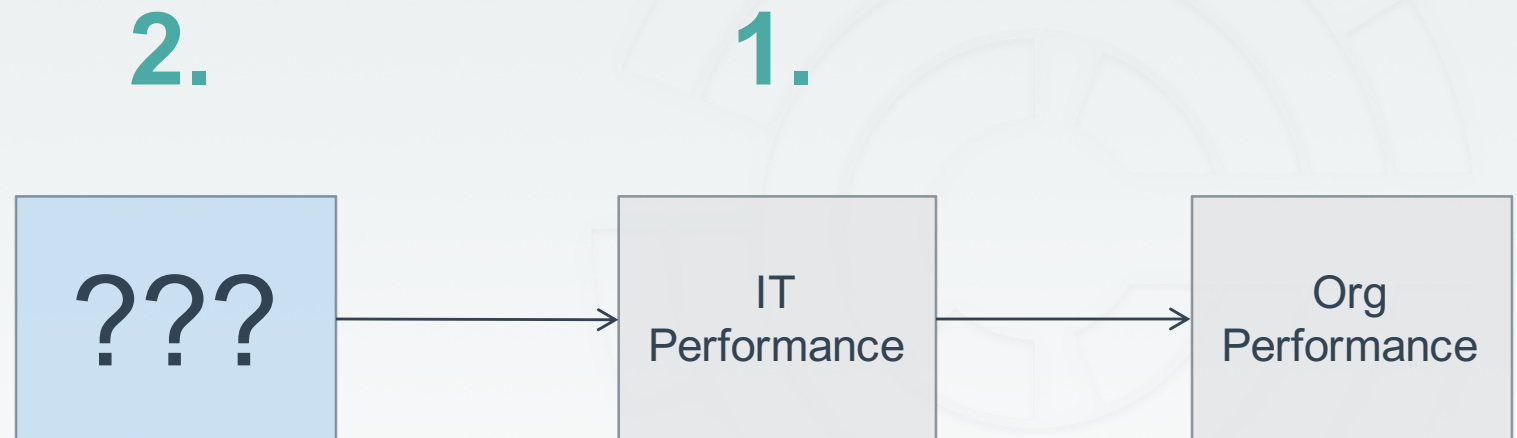


But what *drives* IT Performance?

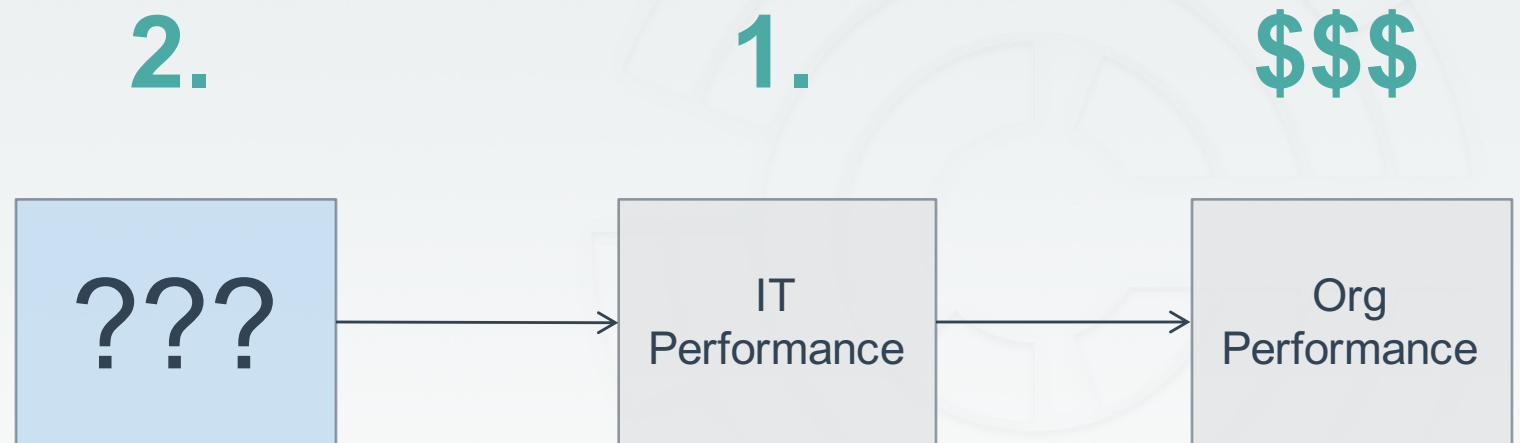
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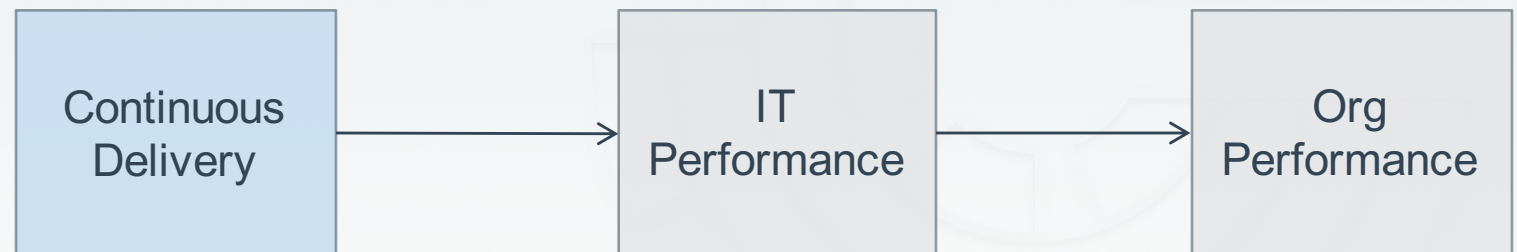
But what *drives* IT Performance?



But what *drives* IT Performance?



But what *drives* IT Performance?

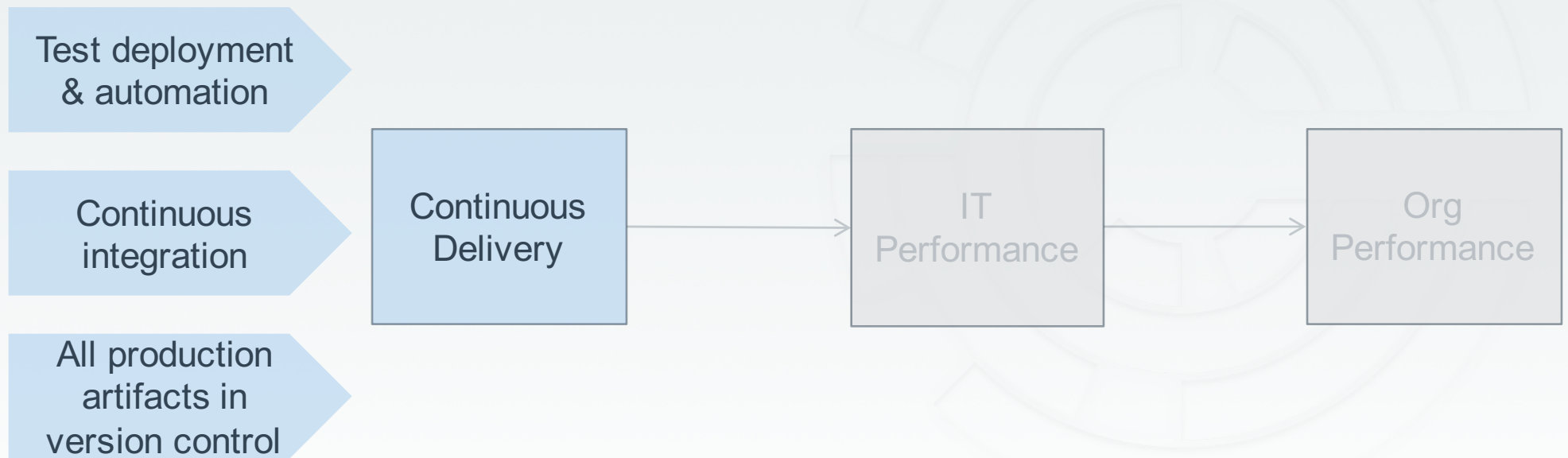


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Continuous Delivery practices

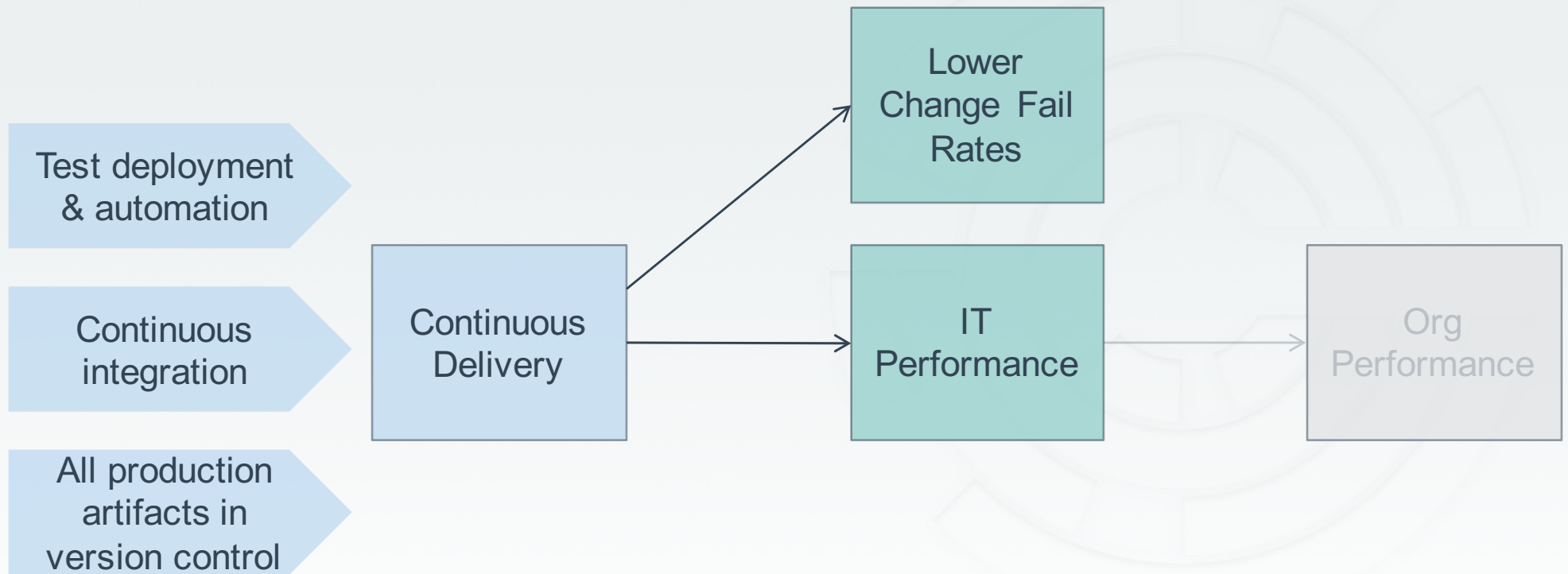


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Continuous Delivery makes our work better



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“We never had testability before. We have it now. We have this experience and know this stuff is working, and working with controls.”

– Product Owner for Yahoo Chef implementation

The Yahoo logo is displayed in white, bold, sans-serif capital letters on a solid purple square background.

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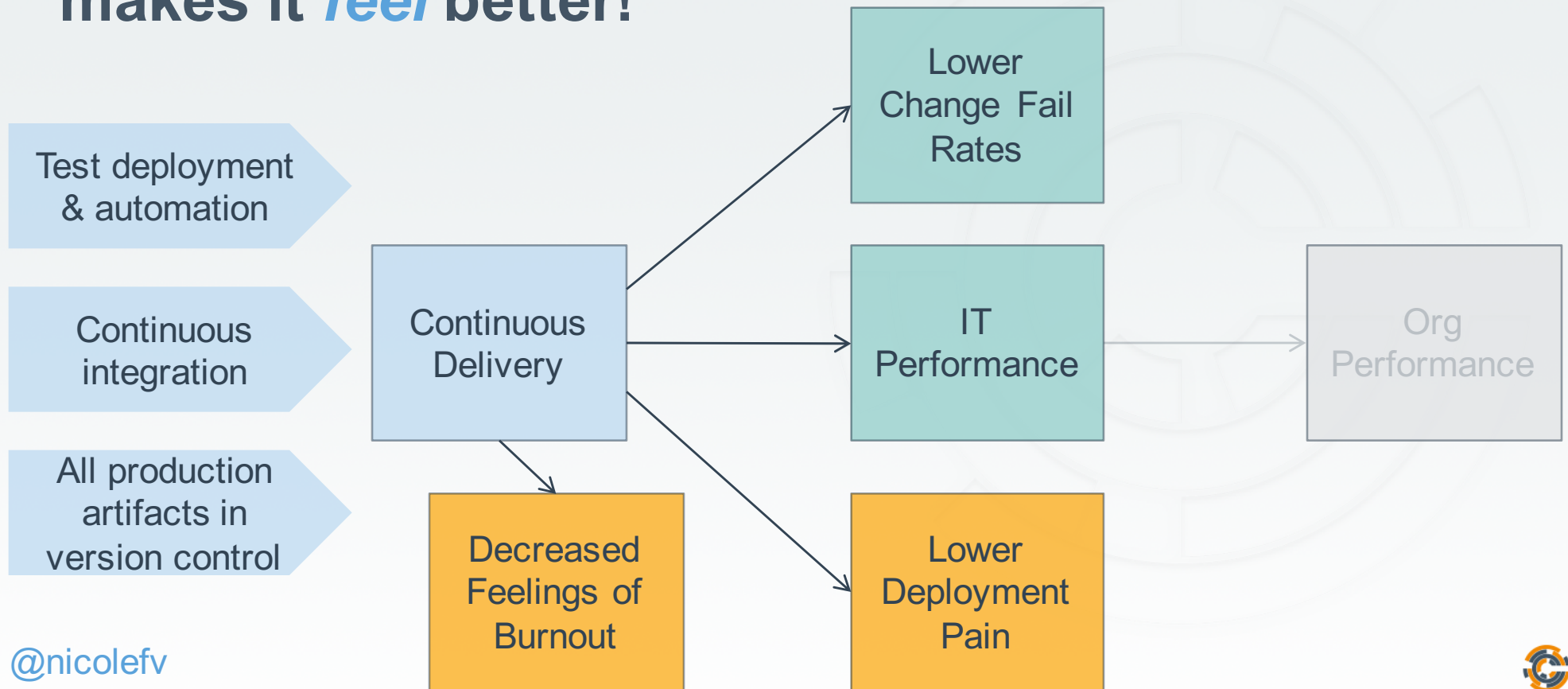
Automated configuration and
deployment of 250,000 nodes

Can deploy up to 140k node
configurations in 8 hours.

Can patch entire infrastructure within 6
hours of a patch being made available



Continuous Delivery makes our work better... and makes it *feel* better!

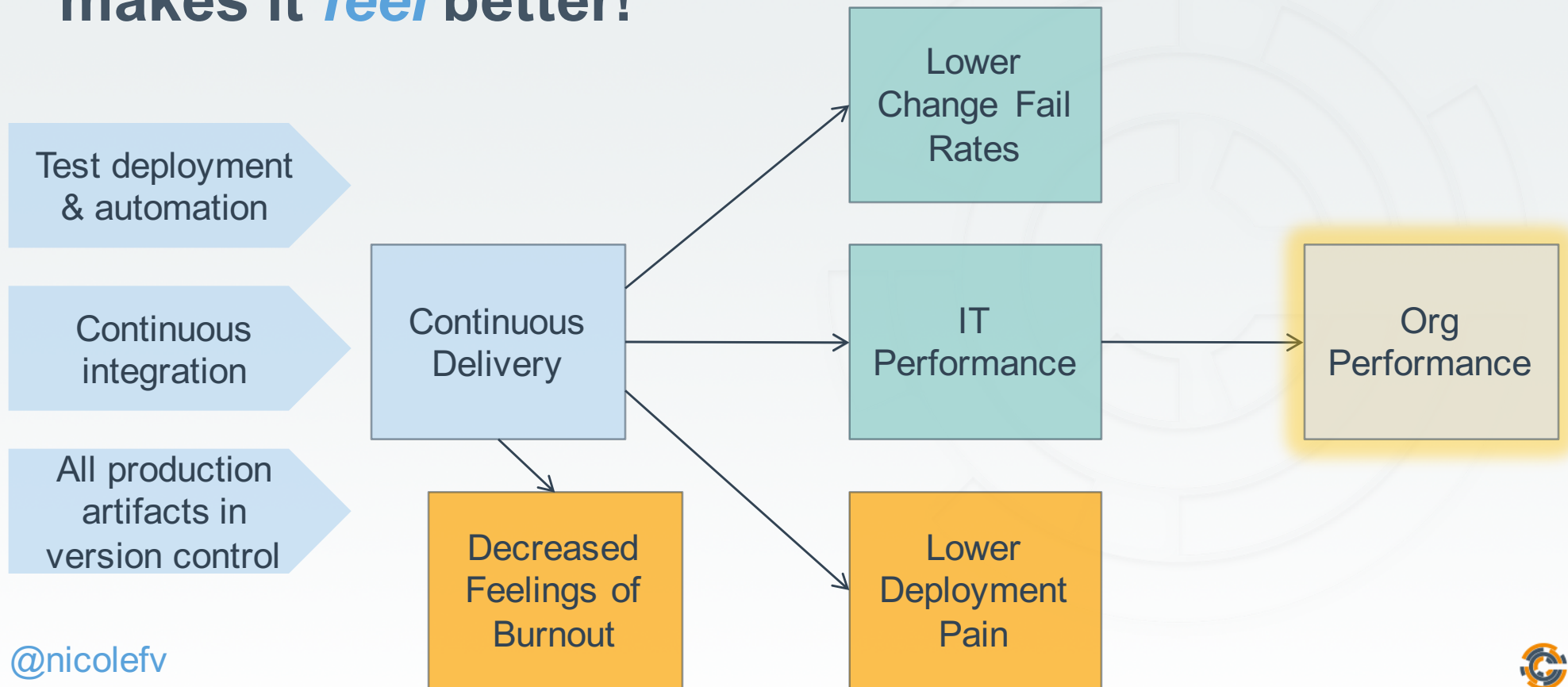


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Continuous Delivery makes our work better... and makes it *feel* better!

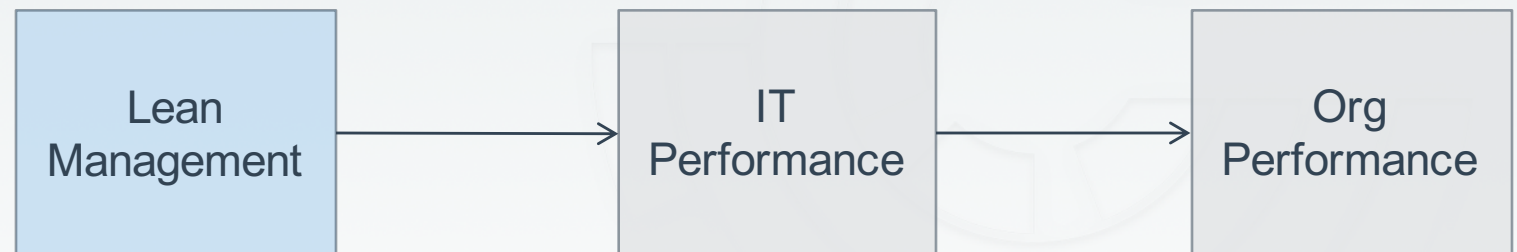


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But what else *drives* IT Performance?

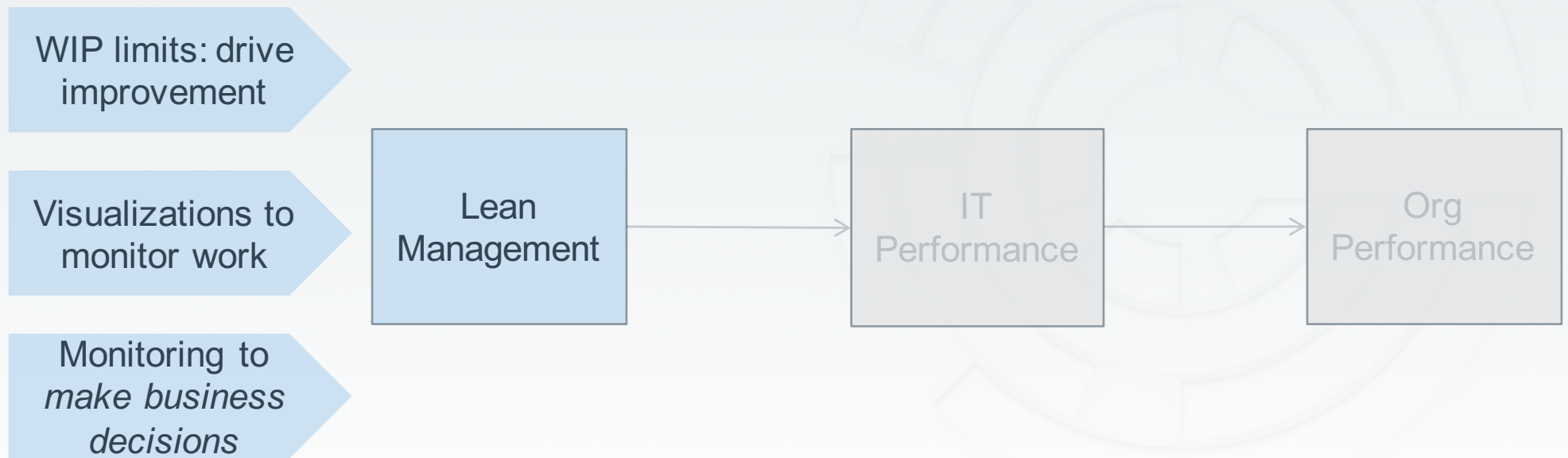


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Lean Management practices

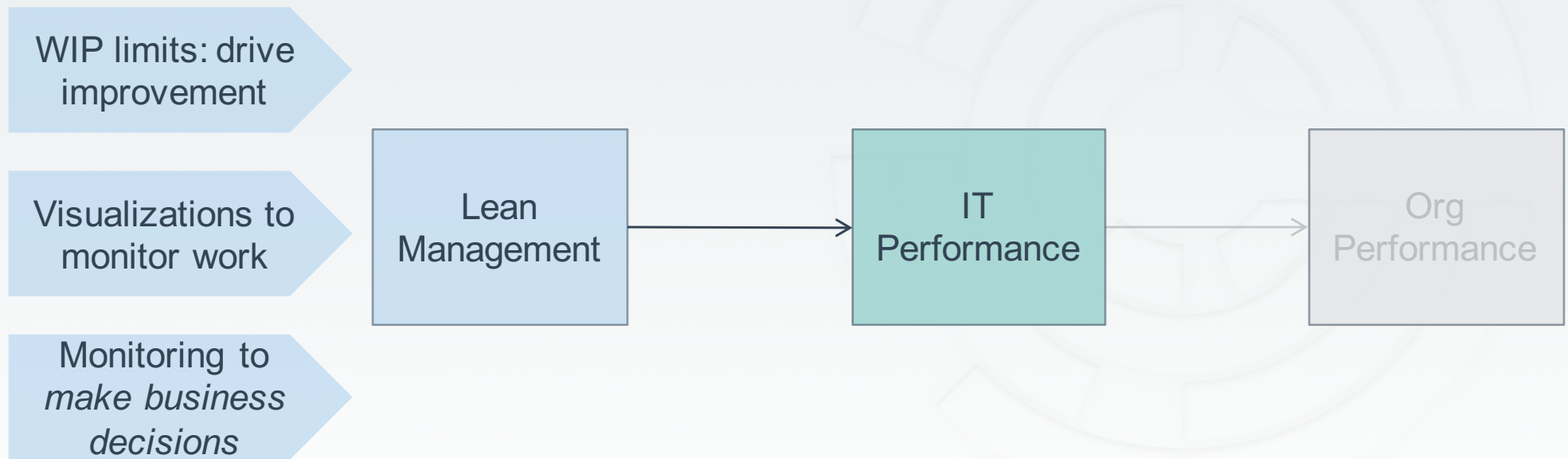


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Lean Management makes our work better



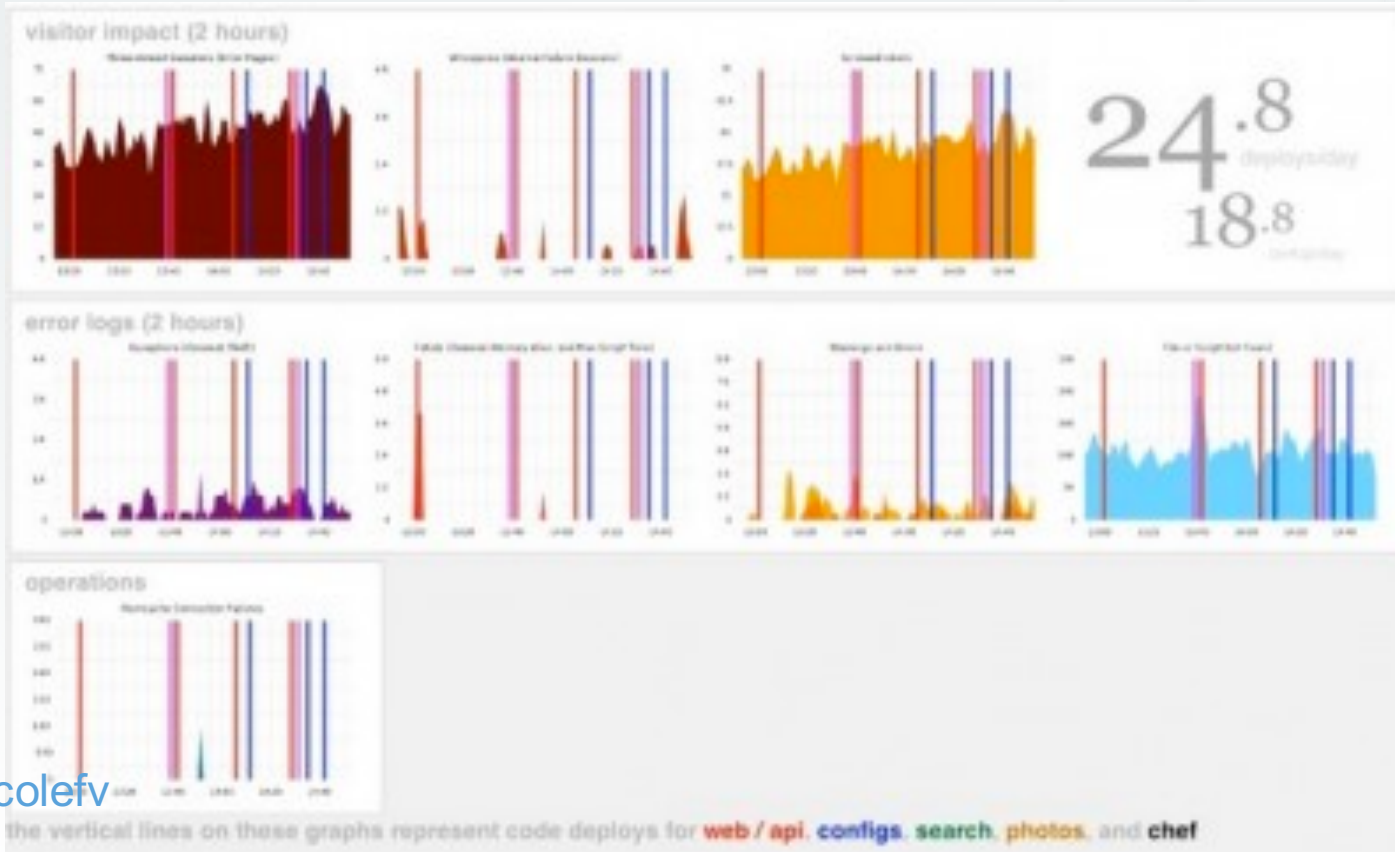
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“If it moves, graph it.”

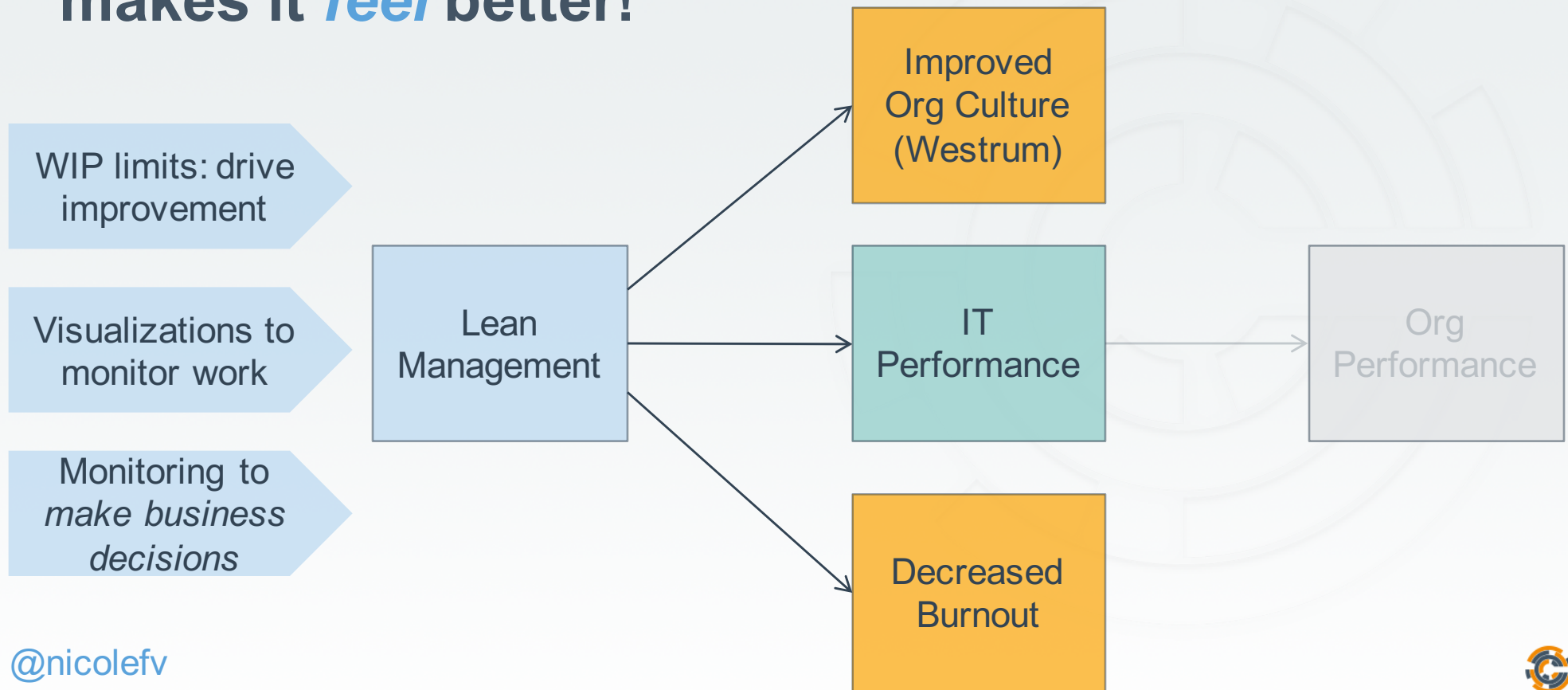
- Michael Rembetsy, Vice President Operations, Etsy



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“I was trying to figure out why my team was working themselves to death but not getting anything done... By implementing WIP limits, we were able to focus on our work. Finishing work feels better than sprinting and feeling like a hero in the moment, because that’s only a moment.”

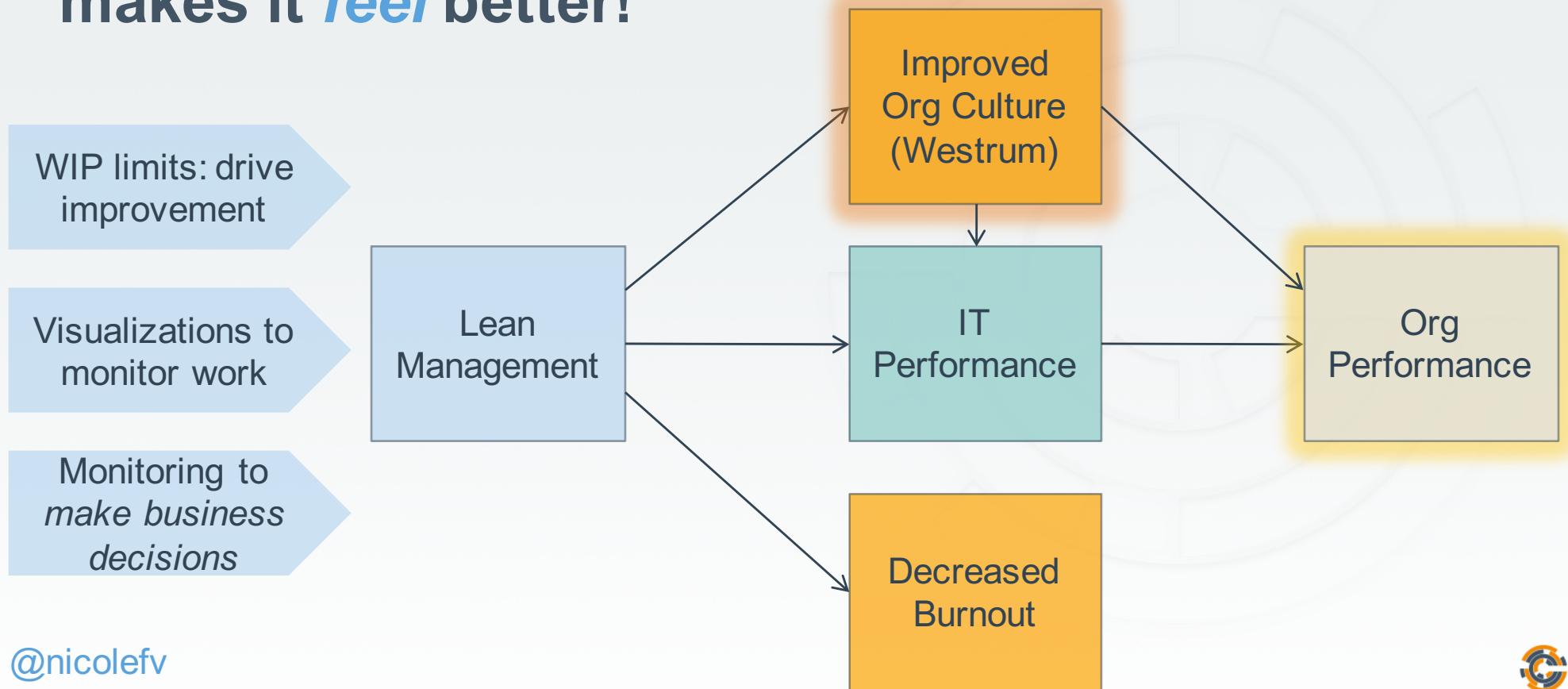
- Julia Wester,
Development Manager
for Turner Sports,
Turner Broadcasting



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DevOps drives IT & Organizational Performance

- ☐ Tooling and automation
- ☐ Practice and process
- ☐ Culture

DevOps drives IT & Organizational Performance

- ☑ Tooling and automation
Continuous Delivery
- ☑ Practice and process
Lean Management
- ☑ Culture
Westrum – high trust & information flow

DevOps isn't just IT. It's the *practice* of IT.

This practice gives us greater efficiency
And contributes to the bottom line.

**This is Lean for the software and technology
transformation revolution.**



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Thank you

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Please

**Remember to
rate session**

Thank you!



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