DevOps: Next
Nicole Forsgren, PhD
Let us know what you think

Click ‘engage’ to rate session.

Rate 12 sessions to get the super cool GOTO reward
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
Amazon Deployment Stats
(product & 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

This is now...
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
New research suggests the transformation is worth it
Devops is good for IT

Measuring DevOps and *IT Performance*
- Deploy frequency (Note: NOT delivery)
- Mean Time to Recover (MTTR)
- Lead Time for Changes
High Performing DevOps teams

More *throughput*

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 *stability*

<table>
<thead>
<tr>
<th>Change Success Rate</th>
<th>Faster Mean time to recovery (MTTR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3x (2014)</td>
<td>48x (2014)</td>
</tr>
</tbody>
</table>
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 *throughput*  

What does this mean for:

- **30x**
  - More frequent deployments

- **200x**
  - Faster lead times

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!
High Performing DevOps teams

More *stability*

What does this mean for:

60x
Fewer deploy failures

168x
Faster MTTR

Value/savings around reliability
Value/savings around uptime
Compliance
Security
Reputation around compliance & security

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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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DevOps is good for organizations
High Performing IT organizations

2x

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

50%

Higher market cap growth over 3 years*

Three main contributors to organizational performance

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

<table>
<thead>
<tr>
<th>Pathological (Power-oriented)</th>
<th>Bureaucratic (Rule-oriented)</th>
<th>Generative (Performance-oriented)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low cooperation</td>
<td>Modest cooperation</td>
<td>High cooperation</td>
</tr>
<tr>
<td>Messengers shot</td>
<td>Messengers neglected</td>
<td>Messengers trained</td>
</tr>
<tr>
<td>Responsibilities shirked</td>
<td>Narrow responsibilities</td>
<td>Risks are shared</td>
</tr>
<tr>
<td>Bridging discouraged</td>
<td>Bridging tolerated</td>
<td>Bridging encouraged</td>
</tr>
<tr>
<td>Failure leads to scapegoating</td>
<td>Failure leads to justice</td>
<td>Failure leads to inquiry</td>
</tr>
<tr>
<td>Novelty crushed</td>
<td>Novelty leads to problems</td>
<td>Novelty implemented</td>
</tr>
</tbody>
</table>

**Top Predictors of Organizational Culture**

- Job satisfaction
- Climate for learning
- Win-win relationship between dev and ops
- Version control
- Automated testing

15%  52%  33%

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“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
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

Job satisfaction is the #1 predictor of organizational performance!
We also know that CD is good for IT and Org performance

Together, the factors on the left model "Continuous Delivery", which leads to...

- Lower levels of deployment pain
- Higher levels of IT performance (higher throughput and stability)
- Higher levels of org performance (productivity, market share, profitability)
- Lower change fail rates

Comprehensive, fast and reliable test and deployment automation
Trunk-based development and continuous integration
Application code and app and system configuration all in version control
... as well as lean management practices.

- Effective WIP limits that drive process improvement
- Use of visual displays to monitor quality, productivity and work in process
- Use of app perf and infra monitoring tools to make business decisions

Together, the factors on the left model "Lean Management", which leads to:

- A generative, performance-oriented culture (per Westrum's model)
- Higher levels of IT performance (higher throughput and stability)
- Lower levels of burnout
- Higher levels of org performance (productivity, market share, profitability)
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.
Thank you

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Please Remember to rate this session Thank you!
Thanks!