

DevOps mindset essentials

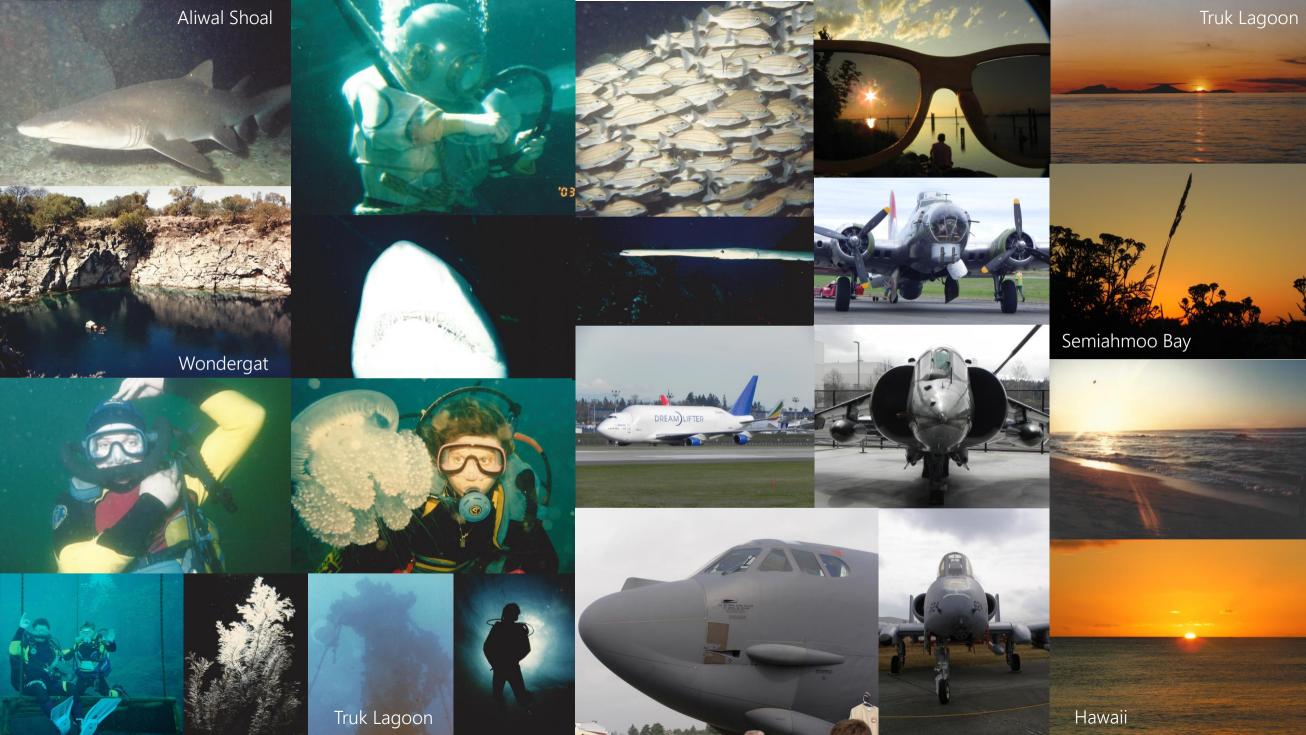


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DevOps is the union of people, process, and products to enable continuous delivery of value to our end users.

> Donovan Brown Microsoft @donovanbrown

http://donovanbrown.com/post/what-is-devops



Definition of Done (DoD)

Live in production, collecting telemetry that examines the hypothesis which motivated the deployment.

From the Microsoft DevOps Story

https://aka.ms/devops



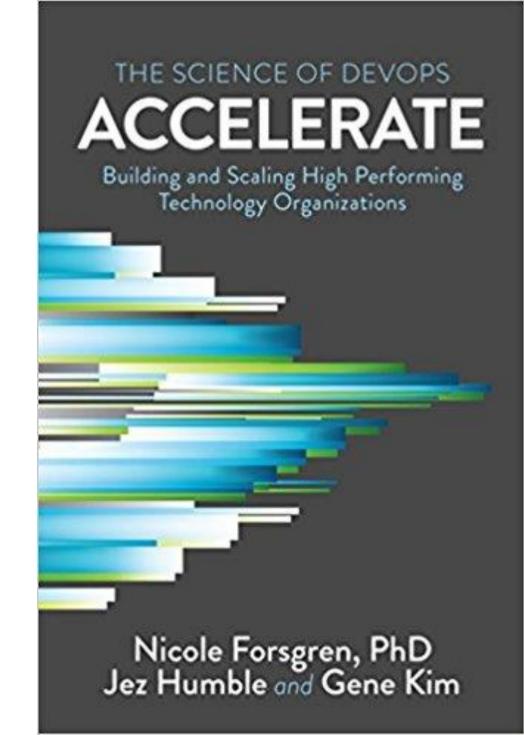
Improvement Is Possible for Everyone!

If leadership provides consistent support.

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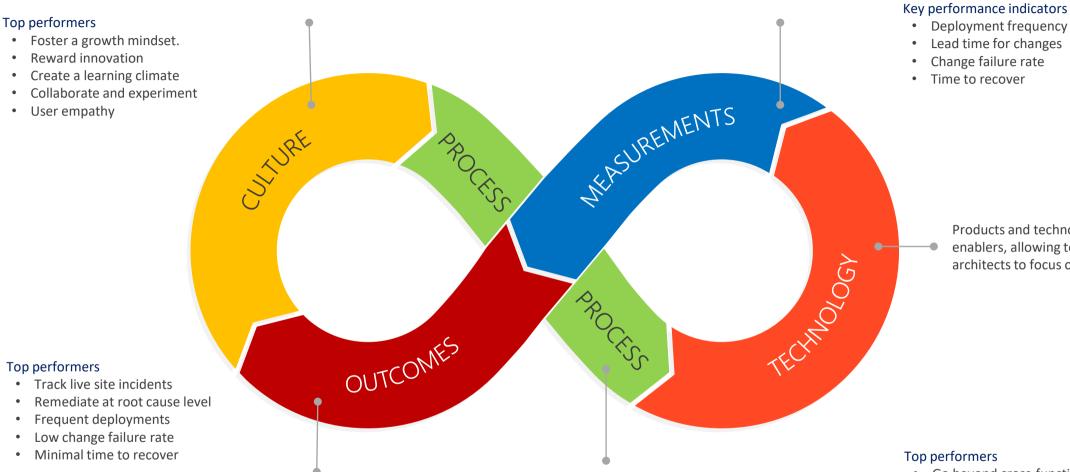
Team members commit themselves to the work.

ACCELERATE book https://t.co/smb82Y4i0M



Monitoring of running applications in production environments enables a DevOps team to detect issues as they occur, to mitigate the impact, and to understand the application health. Further monitoring of customer usage helps organizations form hypotheses and quickly validate or disprove experiments.

Measurement is key to being able to assess performance and target improvement. Measurement allows you to see the state of the app in production, the flow from idea to code to delivery, and the actual usage of the features you produce.



The point of DevOps is to achieve better outcomes. More frequent deployments allow you introduce new value more quickly. Higher deployment velocity gives you faster feedback on every change. Faster time to mitigate failures gives your users higher availability. More successful changes eliminate rework and let you go faster. All of these lead to more satisfied customers and more motivated employees.

The goal for modern application delivery is responsiveness, which relies on flexible scheduling, limiting work in process in favor of iterative experiments, and close team collaboration to facilitate real-time communication and eliminate wasteful handoffs.

Change failure rate Time to recover

Products and technology are enablers, allowing teams and architects to focus on outcomes.

Top performers

- Go beyond cross-functional
- Create multi-disciplinary teams
- Allow autonomous teams to go fast
- Align teams with enterprise objectives
- Common product backlog
- Minimize work in progress
- Nimble and rigorous quality practices

Version control enables teams located anywhere in the world to communicate effectively during daily development activities as well as to integrate with software development tools for monitoring activities such as deployments.

Top performers

Version everything

Testing used to be a slow, infrequent activity. So slow, that testing cadence would determine a team's ability to release. DevOps strives for testing as a continuous activity, embedded into both the developer workflow and the pipeline used for

Teams can use the Public and Hybrid Clouds to gain capacity on demand. With a well-managed cloud, your teams can provision resources as needed and move as fast as they need.

continuous integration and continuous delivery. Use topic branches for short-term isolation Continuously merge changes into master Review and audit using Git pull requests CLOUP *
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CTURE COMITANO OF INFERM MONITORING

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Continuous Integration (CI) refers to the practice of triggering an automated build and test sequence with every commit of code changes. Continuous Delivery (CD) extends this to trigger further testing and the deployment to production, with approval if necessary.

Top performers

- Enable teams to move features swiftly from idea into production
- Create and validate release without impediments or manual rework.

PRODUCTS

ALM

Jira, Mingle, Trello, VSTS

ARTEFACT MNGT.

Azure, Bower, DockerHub

CI

Bamboo, circlci, Jenkins, TeamCity, Travis CI, VSTS

CLOUD

AWS, Azure, Google Cloud

CONFIG MNGT.

Ansible, Chef, PowerShell DSC, puppet, Terraform, Vagrant

DATABASE

DBDeploy, DBmaestro,

DEPLOY

ElasticBox, JuJu, Octopus, Spinnaker, VSTS

FEATURE FLAGS

Feature Switcher, Feature Toggle, FlipIt, LaunchDarkly

KNOWLEDGE SHARE

Confluence, Markdown, Reddit, VSTS

MONITORING

Azure AI, elasticsearch Nagios, splunk, ZABBIX

ORCHESTRATION

Mesophere, Mesos

SECURITY

Whitesource

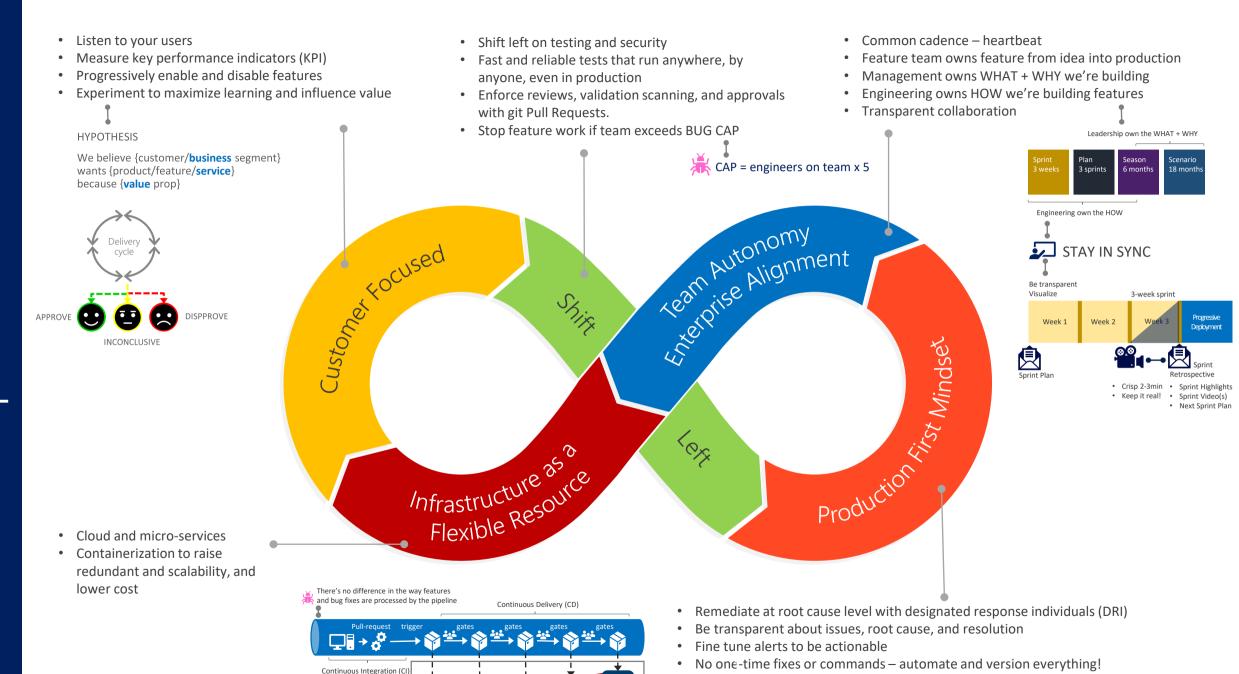
TESTING

asmine, JUnit, Karma, QUnit Selenium, specflow, xUnit

VERSION CONTROL

itBucket, git, GitHub, GitLab,

Source: https://aka.ms/devopsassessment



all rings are in production

Rings to limit blast radius and deploy releases progressively

DevOps X-Ray Assessment https://www.devops-survey.com

Microsoft DevOps Self-Assessment https://aka.ms/devopsassessment

Transforming the culture is the biggest challenge.

All **PEOPLE** need to buy into the transformation, be kept up to date

on all initiatives, understand how their roles will be affected. collaborate transparently, and take responsibility for their features. PRODUCTS (<u>></u>) (2) 5 VALUE (3)

It's about delighting our customers with VALUE!

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Key performance indicators

- Deployment frequency
- Lead time for changes
- Change failure rate
- · Time to recover

Leadership

- Vision
- Inspirational communications
- Intellectual stimulation
- Supportive leadership
- Personal recognition

Team Culture

- Cross-functional collaboration
- Climate of learning
- Effective use of tools
- Everyone is responsible

Culture

- Value stream based teams
- Dogfooding and canaries
- Org trained to run the business
- Everyone empowered
- Everyone responsible and on call
- Everyone engaged in the team

Key PROCESS Goals

to focus on outcomes.

PRODUCTS and technology are enablers, allowing teams and architects

- Focus on quality (security, test, deploy,...)
- Loosely coupled architectures enable scaling
- Lightweight change management process
- Automate everything fast, stable, consistent
- Multiple releases per day
- Celebrate success as a team and organization!

Live Site Incidents

- Track live site incidents
- Remediate at root cause level

Lean Management

- Limit work in progress (WIP)
- Visual (dashboards) work management
- Create a production feedback loop
- Lightweight (empower, trust) change approvals

Lean Development

- Work in small batches (WIP)
- Make flow of work visible (dashboards)
- Gather & action feedback
- Experiment, learn, and influence



HYPOTHESIS

We believe {customer/business segment} wants {product/feature/service} because {value prop}

Continuous Delivery

- Built-in quality
- Work in small batches
- Use computer for repetitive tasks
- Continuous improvement
- Everyone is responsible

Sources: https://aka.ms/devops, ACCELERATE book, and DevOps Handbook

Sample Survey Questions

Kikert-type questions (scale strongly disagree (1) – strongly agree (7))

- Information is actively sought
- Messengers are not punished when they deliver news of failures or other bad news
- Repositories are shared
- Cross-functional collaboration is encouraged and rewarded
- Failure causes injury
- New ideas are welcome
- Failures are treated primarily as opportunities to improve the system

Free-style questions

How painful are your deployments

NPS-type questions (1-10)

- Would you recommend your ORGANIZATION as a place to work for a friend or colleague?
- Would you recommend your TEAM as a place to work for a friend or colleague?

Where are you?

2017 SURVEY	HIGH performers	MEDIUM performers	LOW performers
Deployment Frequency	On demand, multiple per day	Between once per week and once per month	Between once per week and once per month
Lead Time for Changes	< one hour	Between one week and one month	Between one week and one month
MTTR	< one hour	< one day	Between one day and one week
Change Failure Rate	0 - 15%	0 – 15%	31 – 45%

Compared to low-, high performers deliver

x **lower** change failure rate

x more frequent code deployments

x faster mean time to recover (MTTR) from downtime

x faster lead time from commit to deploy

Microsoft DevOps Transformation Story

Before

- 4-6 month milestones
- Horizontal teams
- Personal offices
- Long planning cycles
- PM, Dev, Test
- Yearly customer engagement
- Feature branches
- 20+ person teams
- Secret roadmap
- Bug debt
- 100 page spec documents
- Private repositories
- Deep organizational hierarchy
- Success is a measure of install numbers
- Features shipped once a year

After

- 3-week sprints
- Vertical teams
- Team rooms
- Continual Planning & Learning
- PM & Engineering
- Continual customer engagement
- Everyone in master
- 8-12 person teams
- Publicly shared roadmap
- Zero debt
- Mockups in PPT
- Inner source
- Flattened organization hierarchy
- User satisfaction determines success
- Features shipped every sprint

ALM | DevOps Ranger Transformation Story

Before

- 10-15 person teams
- 2 program managers
- Manual and error prone builds
- Manual and error probe releases
- 6-12 sprint cadence
- 1 month sprints
- Issues detected by users
- Days to weeks to resolve issues
- Hours to build
- Days to release

After

- 2-5 person teams
- 0.25 program managers
- Automated Cl
- Automated CD
- 3-5 sprints cadence
- 3-week sprints
- Proactive telemetry
- Minutes to days to resolve issues
- Minutes to build
- Minutes to release

Contribute to deck and posters

https://github.com/wpschaub/ DevOps-mindset-essentials



References

aka.ms/devops

DevOps @ Microsoft story

aka.ms/vsar-rings

aka.ms/vsar-flags

aka.ms/vsar-rings-flags

Ring article

Feature flag article

Rings or flags article

aka.ms/vsar-pipes

ALM | DevOps Rangers CI/CD Pipelines

Thank you!

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