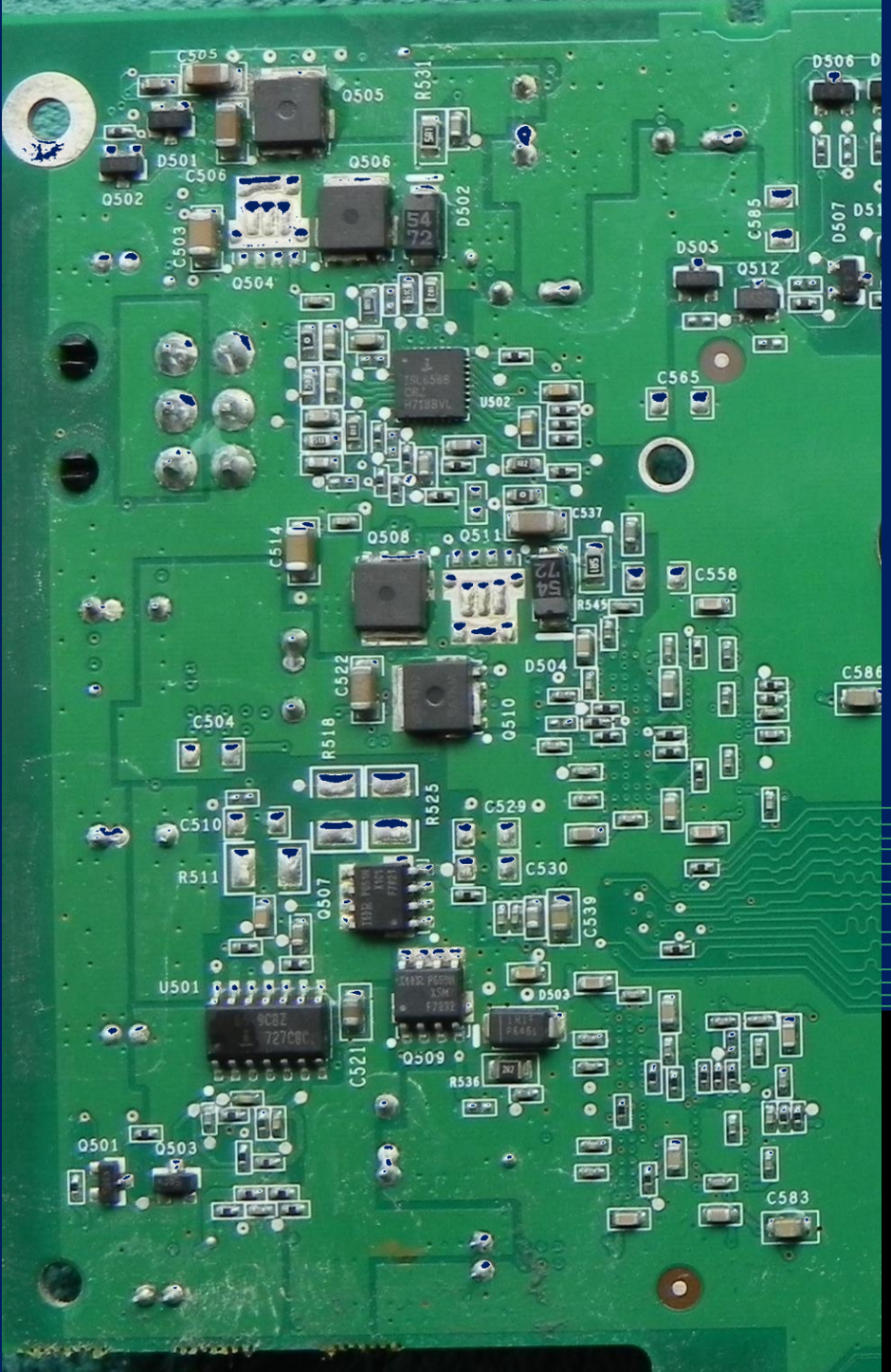

DevOps mindset essentials

GLOBAL DEVOPS BOOTCAMP

BY XPIRIT & SOLIDIFY

JUNE 16, 2018

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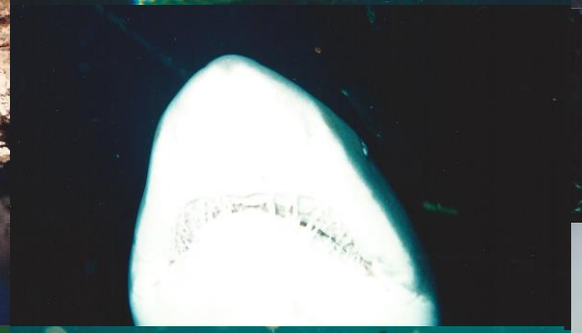
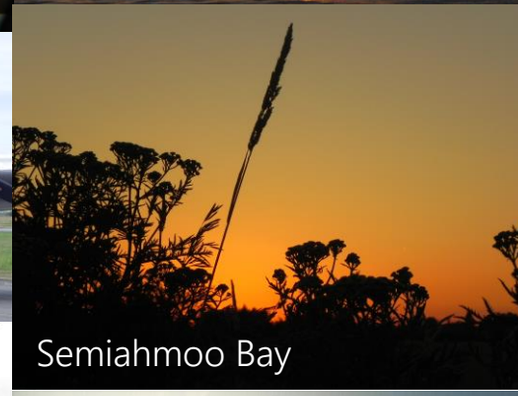
I work here
I was born here
I grew up here


Aliwal Shoal

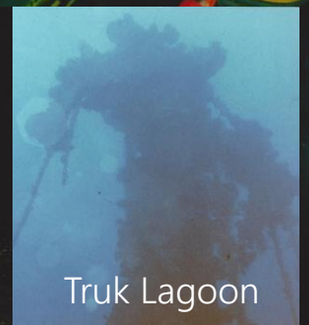

Truk Lagoon

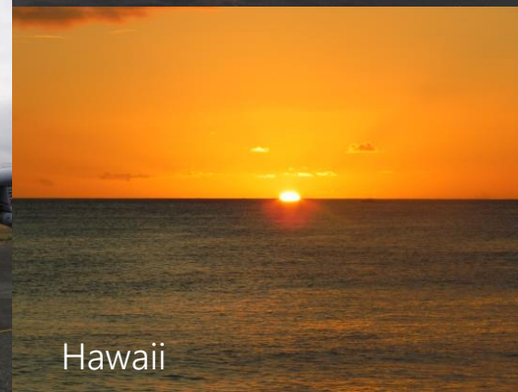

Wondergat




Semiahmoo Bay


DREAMLIFTER


Truk Lagoon


Hawaii

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

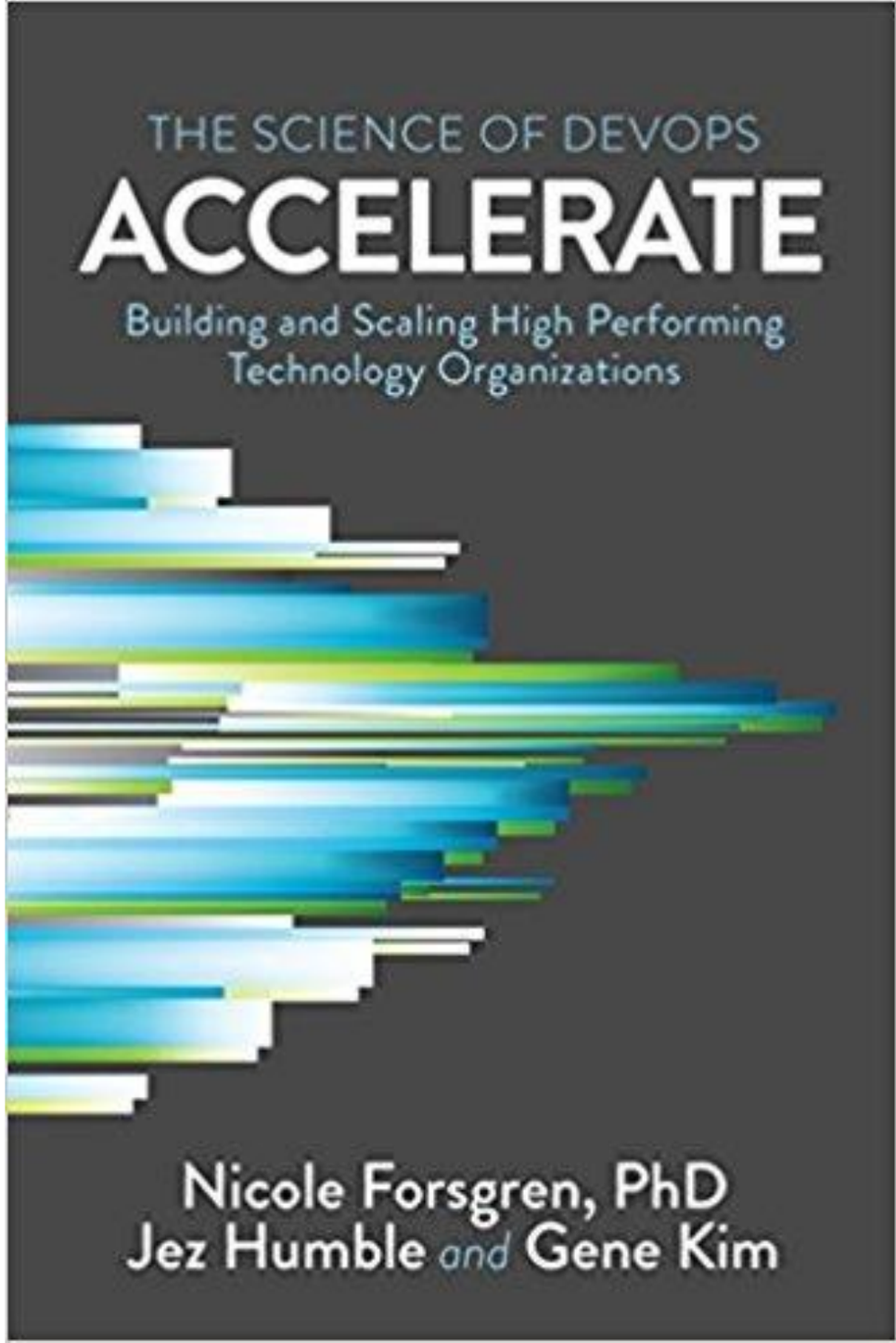
Improvement Is Possible for Everyone!

If leadership provides consistent support.

+

Team members commit themselves to the work.

ACCELERATE book
https://t.co/smb82Y4i0M



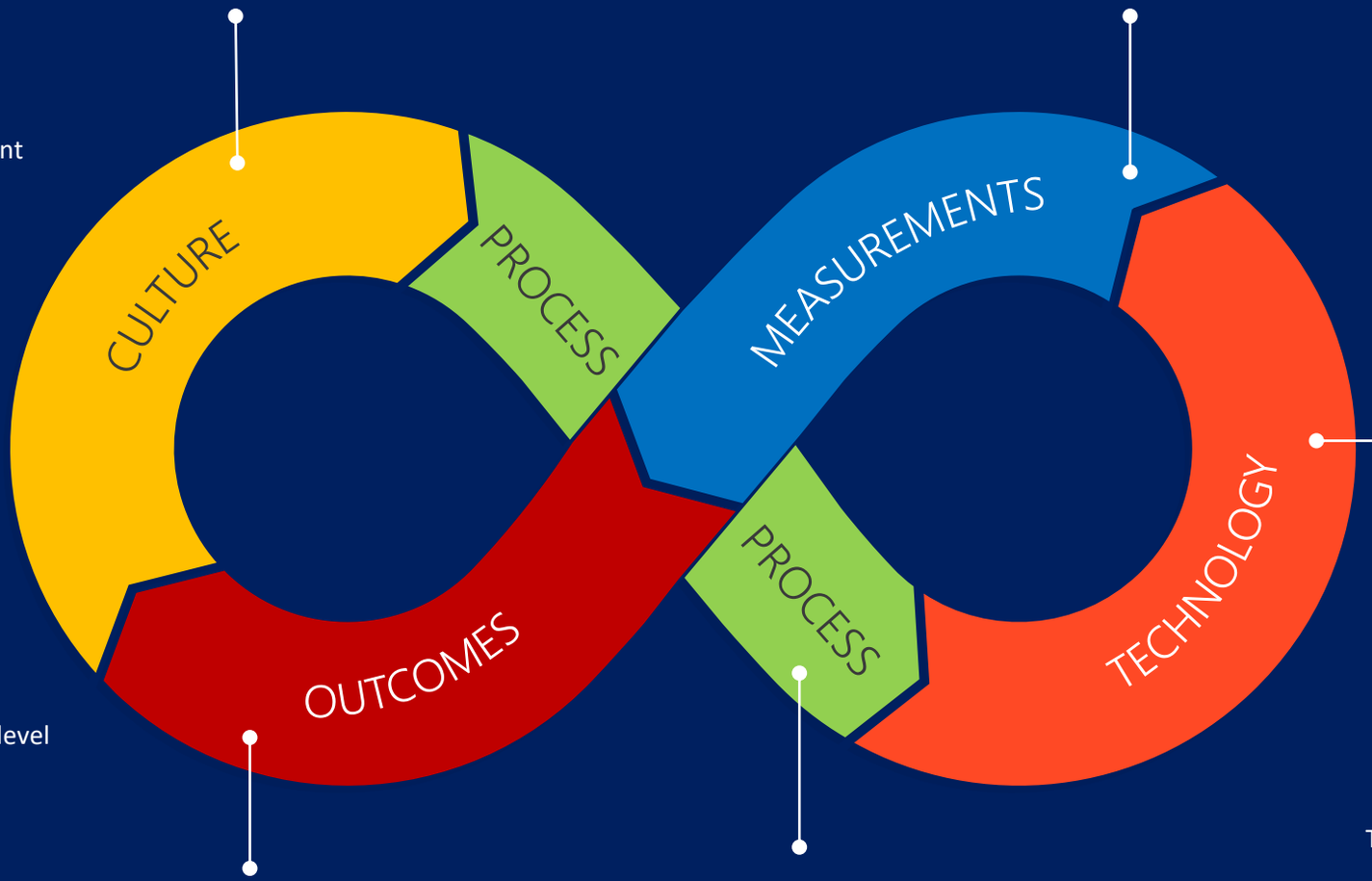
DevOps Practices

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.

Top performers
- Foster a growth mindset.
- Reward innovation
- Create a learning climate
- Collaborate and experiment
- User empathy

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.

Key performance indicators
- Deployment frequency
- Lead time for changes
- Change failure rate
- Time to recover



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

Top performers
- Track live site incidents
- Remediate at root cause level
- Frequent deployments
- Low change failure rate
- Minimal time to recover

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.

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

DevOps Technology

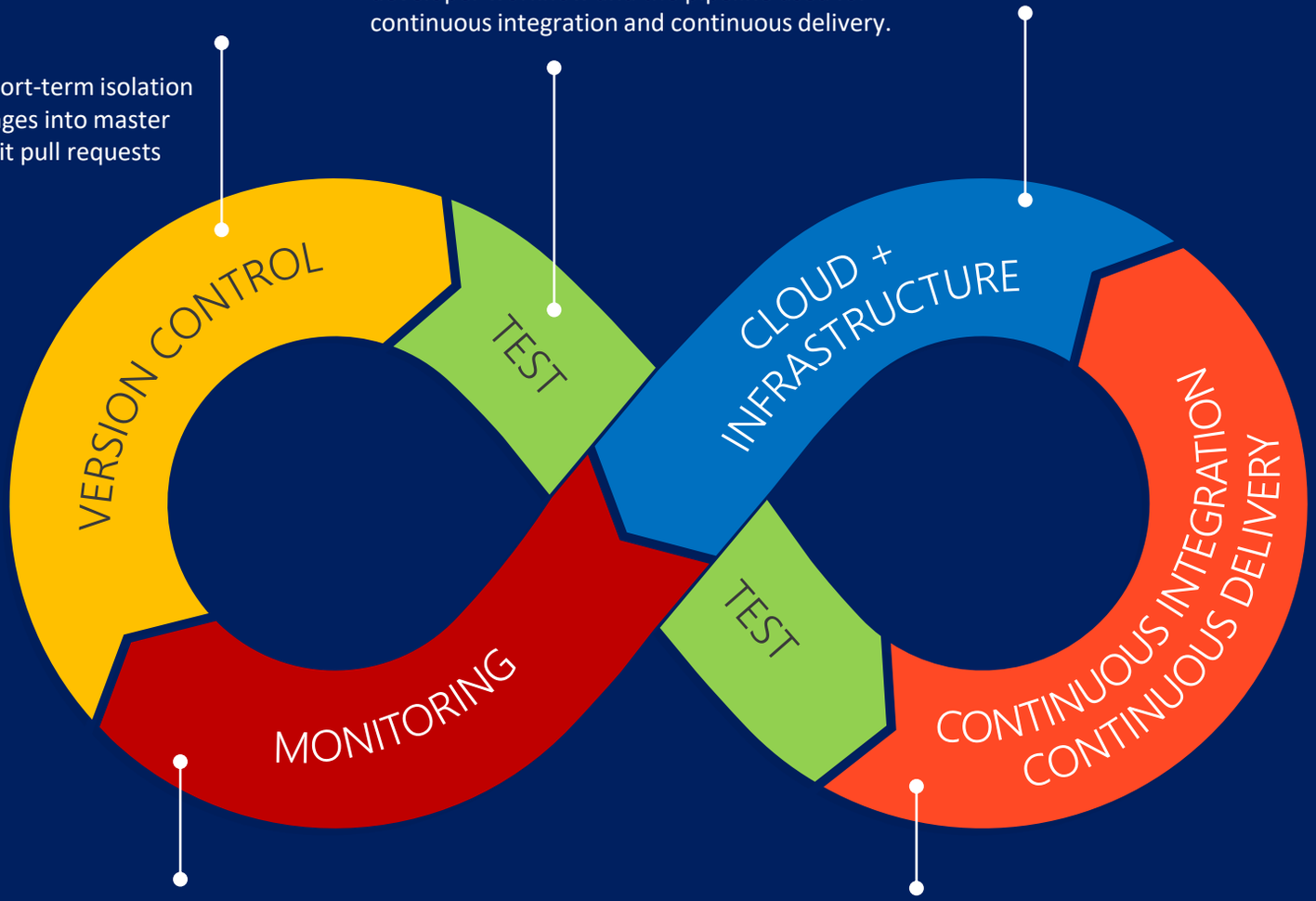
Version control enables teams located anywhere in the world to communicate effectively during daily development activities as well as to integrate with software development tools for monitoring activities such as deployments.

Top performers

- Use topic branches for short-term isolation
- Continuously merge changes into master
- Review and audit using Git pull requests
- 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 continuous integration and continuous delivery.

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.



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.

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, Rally, Trello, VersionOne, VSTS

ARTEFACT MNGT.

Azure, Bower, DockerHub, Nexus, npm, nuget, VSTS

CI

AppVeyor, Bamboo, circlci, Jenkins, JFrog Artifactory, TeamCity, Travis CI, VSTS

CLOUD

AWS, Azure, Google Cloud

CONFIG MNGT.

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

DATABASE

DBDeploy, DBmaestro, Redgate

DEPLOY

BuildMaster, ElasticBox, JuJu, Octopus, servicenow, Spinnaker, VSTS

FEATURE FLAGS

Feature Switcher, Feature Toggle, FlipIt, LaunchDarkly, NFeature

KNOWLEDGE SHARE

Confluence, Markdown, Reddit, VSTS

MONITORING

Azure AI, Dynatrace, elasticsearch, Nagios, New Relic, splunk, ZABBIX

ORCHESTRATION

Docker Swarm, kubernetes, Mesophere, Mesos

SECURITY

Whitesource

TESTING

BugZilla, Gradle, Jasmine, JUnit, Karma, QUnit, Redmine, Selenium, specflow, xUnit

VERSION CONTROL

BitBucket, git, GitHub, GitLab, source forge, TFVC

DevOps Habits

- Listen to your users
- Measure key performance indicators (KPI)
- Progressively enable and disable features
- Experiment to maximize learning and influence value

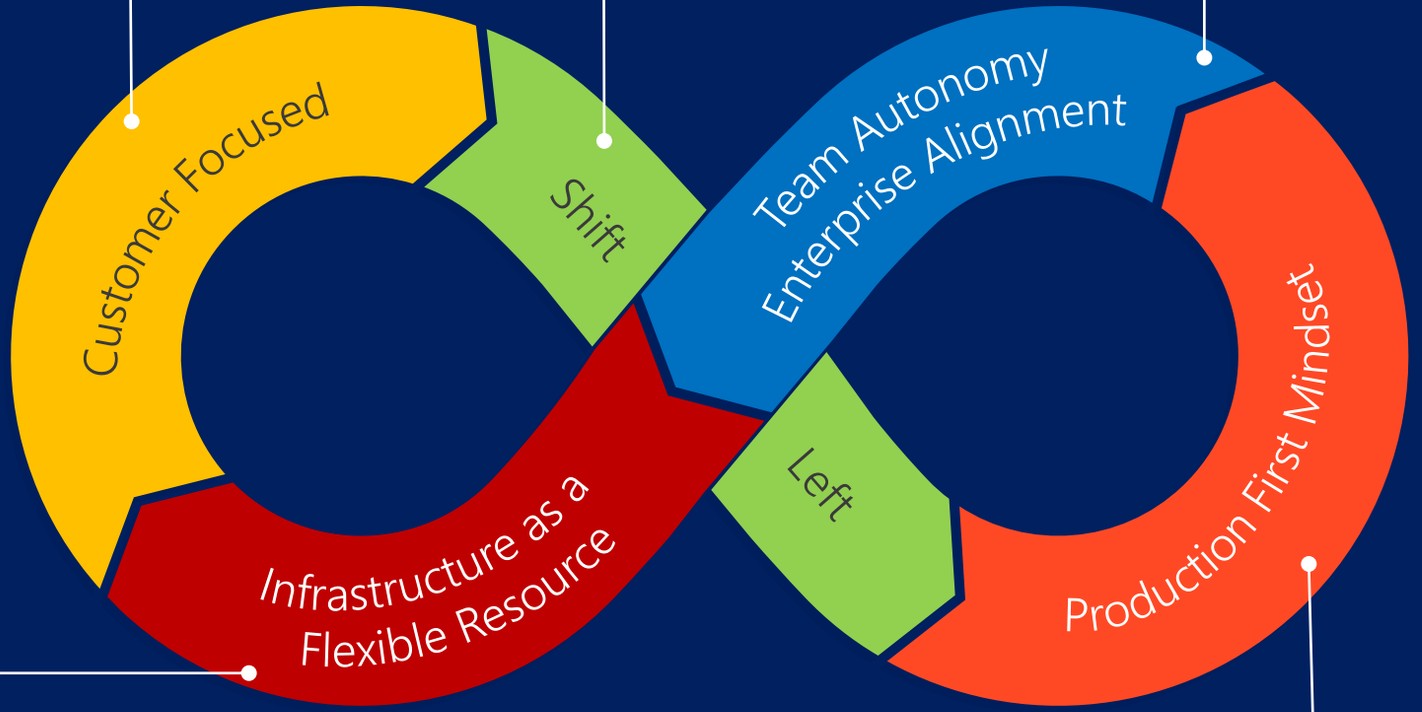
HYPOTHESIS

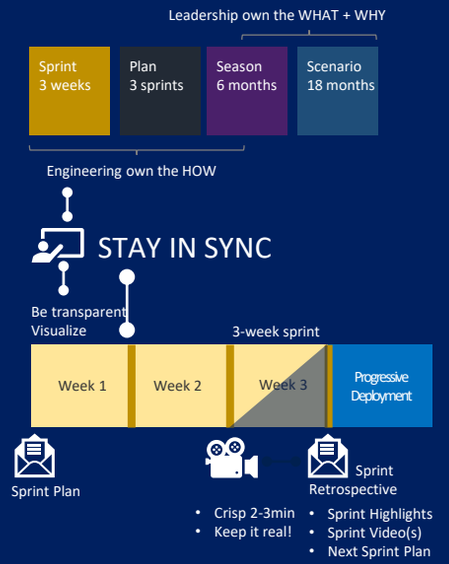
We believe {customer/**business** segment}
wants {product/feature/**service**}
because {**value** prop}

- Shift left on testing and security
- Fast and reliable tests that run anywhere, by anyone, even in production
- Enforce reviews, validation scanning, and approvals with git Pull Requests.
- Stop feature work if team exceeds BUG CAP

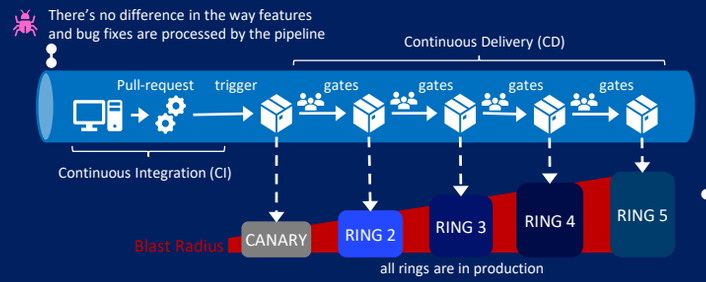
CAP = engineers on team x 5

- Common cadence – heartbeat
- Feature team owns feature from idea into production
- Management owns WHAT + WHY we're building
- Engineering owns HOW we're building features
- Transparent collaboration





- Cloud and micro-services
- Containerization to raise redundant and scalability, and lower cost



- Remediate at root cause level with designated response individuals (DRI)
- Be transparent about issues, root cause, and resolution
- Fine tune alerts to be actionable
- No one-time fixes or commands – automate and version everything!
- Rings to limit blast radius and deploy releases progressively

DevOps Getting Started

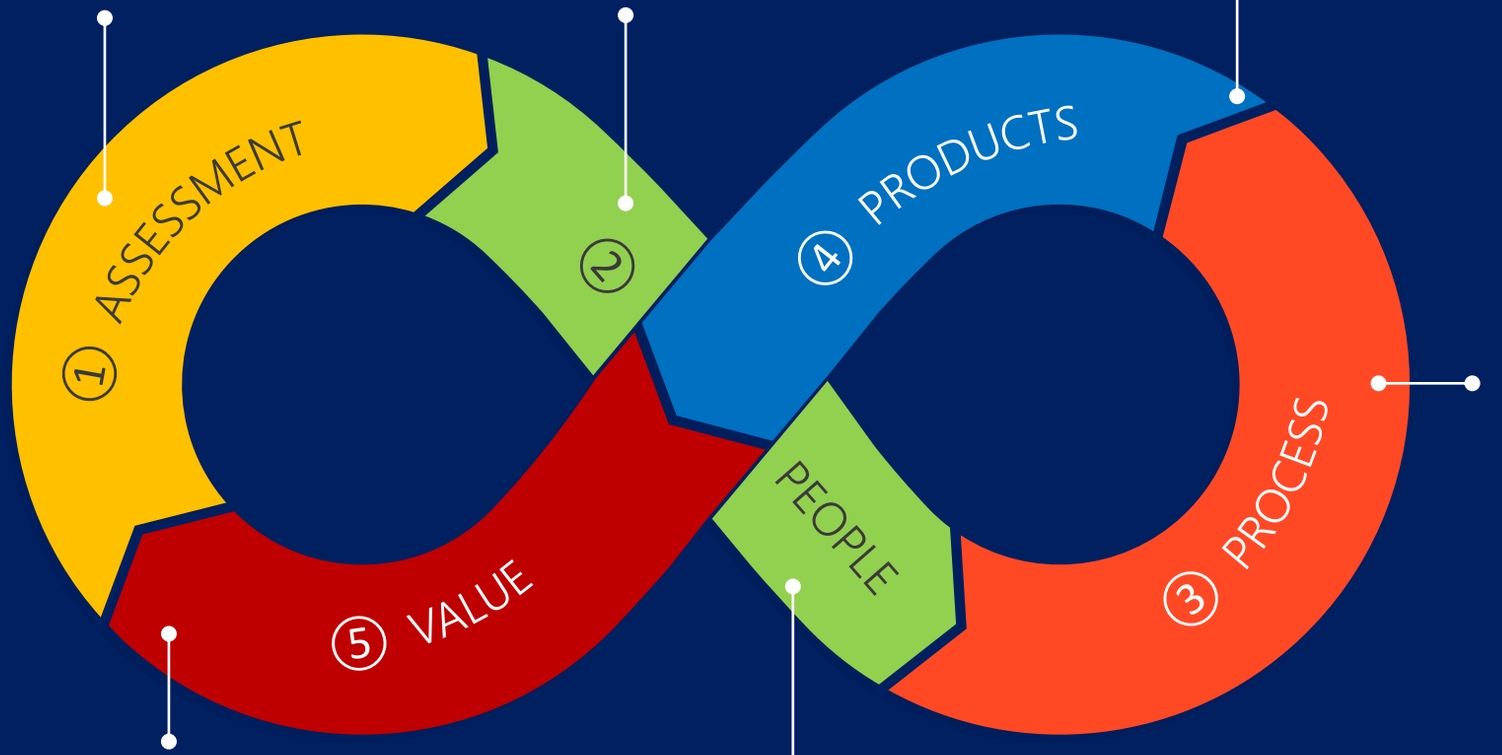
DevOps X-Ray Assessment
https://www.devops-survey.com

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

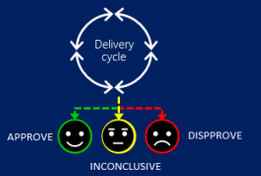


Key **PROCESS** Goals
- Automate everything – fast, stable, consistent
- Celebrate success as a team and organization!
- Focus on quality (security, test, deploy,…)
- Lightweight change management process
- Loosely coupled architectures enable scaling
- Multiple releases per day

Live Site Incidents
- Track live site incidents
- Remediate at root cause level

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

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



HYPOTHESIS

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

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

It's about delighting our customers with **VALUE**!

Key performance indicators
- Change failure rate
- Deployment frequency
- Lead time for changes
- Time to recover

Leadership
- Accept failures as normal
- Inspirational communications
- Intellectual stimulation
- Own the vision
- Personal recognition
- Supportive leadership

Culture
- Climate of learning
- Cross-functional collaboration
- Dogfooding and canary environments
- Effective use of tools
- Everyone empowered
- Everyone responsible and on call
- Trained to run the business
- Value stream-based teams

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?

Source: ACCELERATE book

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%

Source: ACCELERATE book

Compared to low-, high performers deliver

5 x **lower** change failure rate

46 x **more** frequent code deployments

170 x **faster** mean time to recover (MTTR) from downtime

440 x **faster** lead time from commit to deploy

Source: ACCELERATE book

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

Source: https://aka.ms/devops

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 CI
- Automated CD
- 3-5 sprints cadence
- 3-week sprints
- Proactive telemetry
- Minutes to days to resolve issues
- Minutes to build
- Minutes to release

Source: https://aka.ms/devops

Contribute to deck and posters

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

References

aka.ms/**devops**	DevOps @ Microsoft story
aka.ms/**vsar-rings**	**Ring** article
aka.ms/**vsar-flags**	**Feature flag** article
aka.ms/**vsar-rings-flags**	**Rings** or **flags** article
aka.ms/**vsar-pipes**	ALM | DevOps Rangers CI/CD Pipelines

Thank you!

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