

Finding Your Way with Software Engineering Buzzwords

Hasan Yasar

Technical Director, Adjunct Faculty Member

Software Engineering Institute | Carnegie Mellon University

This material is based upon work funded and supported by the Department of Defense under Contract No. FA8702-15-D-0002 with Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center.

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DM22-1131

DevOps/DevSecOps is...



DevOps is a set of principles and practices emphasizing collaboration and communication between software development teams and IT operations staff along with acquirers, suppliers, and other stakeholders in the lifecycle of a software system

DevSecOps is a model on integrating the software development and operational process considering security activities: requirements, design, coding, testing, delivery, deployment and incident response.

Mature DevOps practices are constantly testing, deploying and validating that software meets every requirement and allows for fast recovery in the event of a problem. As a result we can easily say,

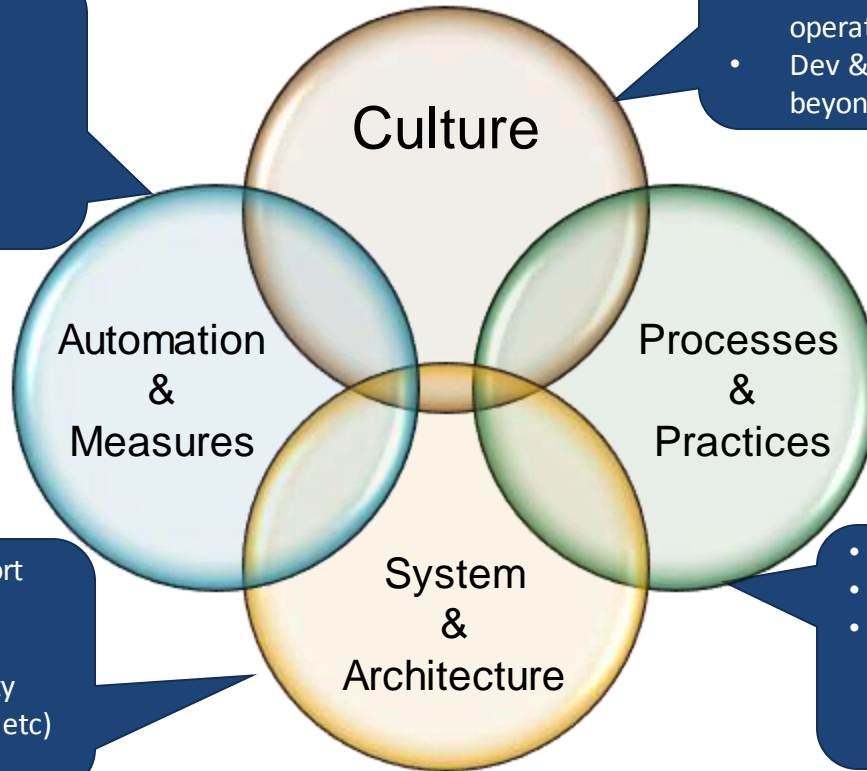
“DevSecOps is DevOps done right”

DevOps has four Fundamental Principles

- ✓ **Collaboration:** Between all stakeholders
- ✓ **Infrastructure as Code:** all assets are versioned, scripted, and shared where possible
- ✓ **Automation:** deployment, testing, provisioning, any manual or human-error-prone process
- ✓ **Monitoring:** any metric in the development or operational spaces that can inform priorities, direction, and policy

Might Seem Simple, but not EASY!

- What Some People Think Boundaries of DevSecOps is!
- Automate repetitive, error-prone tasks
- Static & Dynamic Systems Analysis
- Performance dashboards

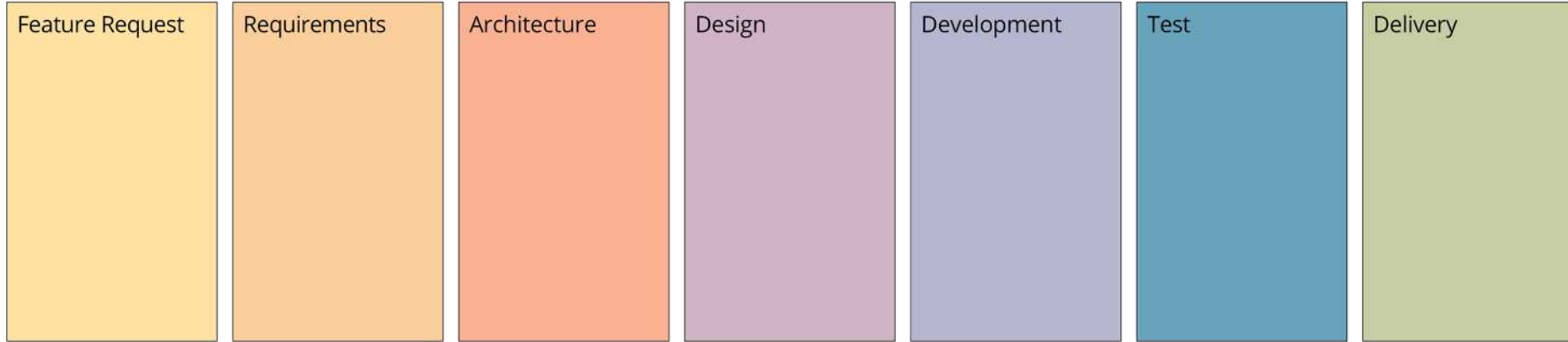


- All roles collaborate
- Dev, Ops, Sustainment have stakeholders that understand operational drivers
- Dev & Ops support products beyond delivery

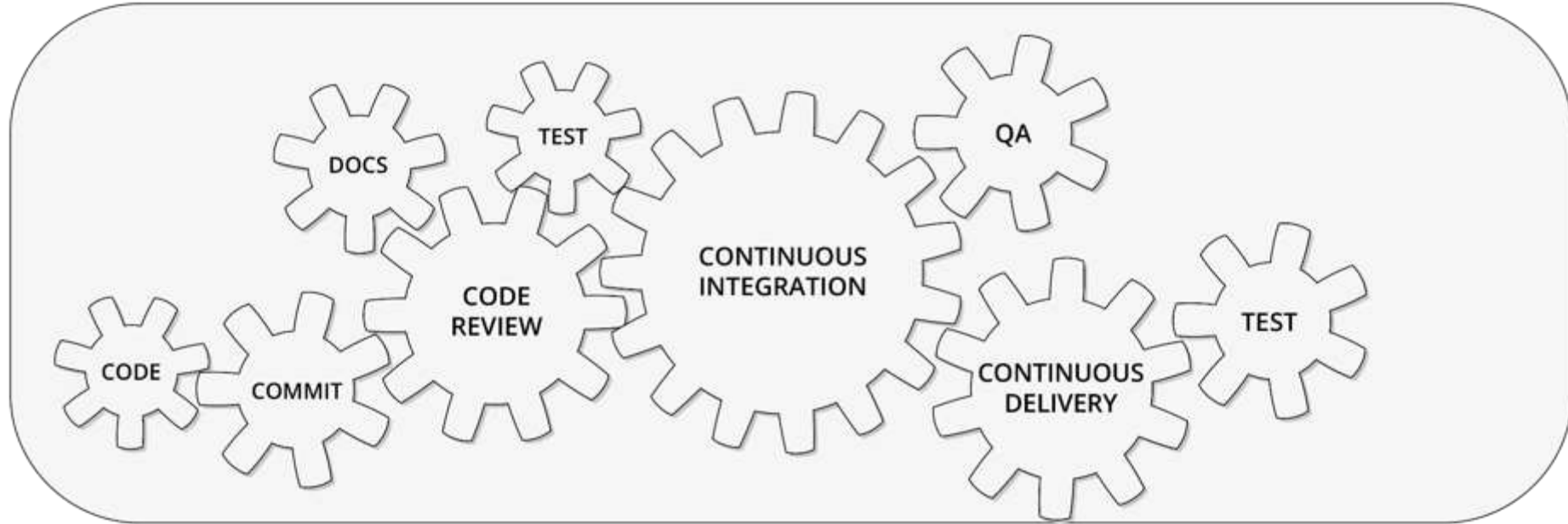
- System architected to support integration and automation goals
- Represents important quality attributes (scalable, secure, etc)

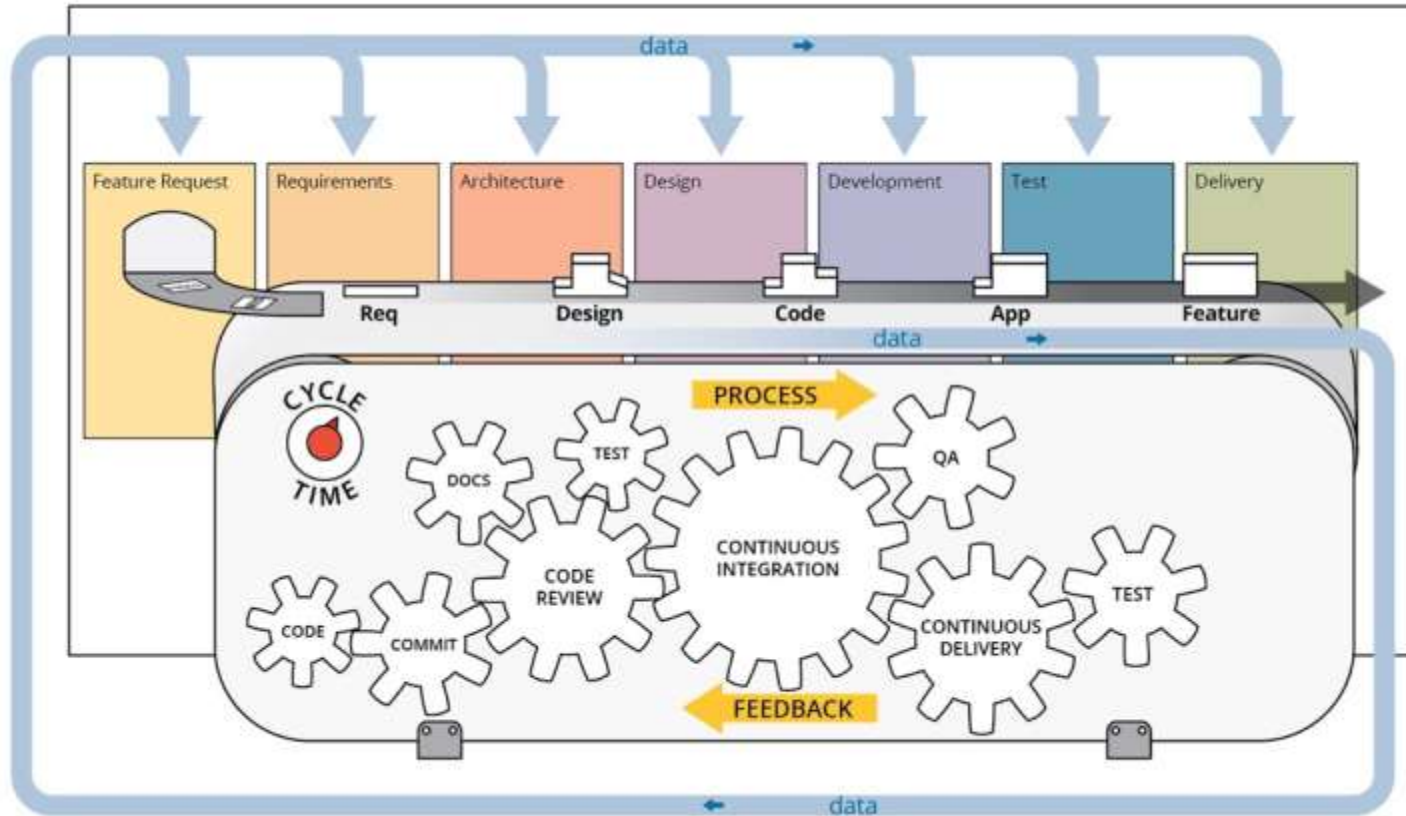
- Value stream understanding
- Whole pipeline accounted for
- Continuous integration, automated test, virtualization, self-serve, scripting, automated deployment...

SW Development Phases – *on each iteration/sprint*



Automation with IaC, CI, CD





Dev



&

Ops



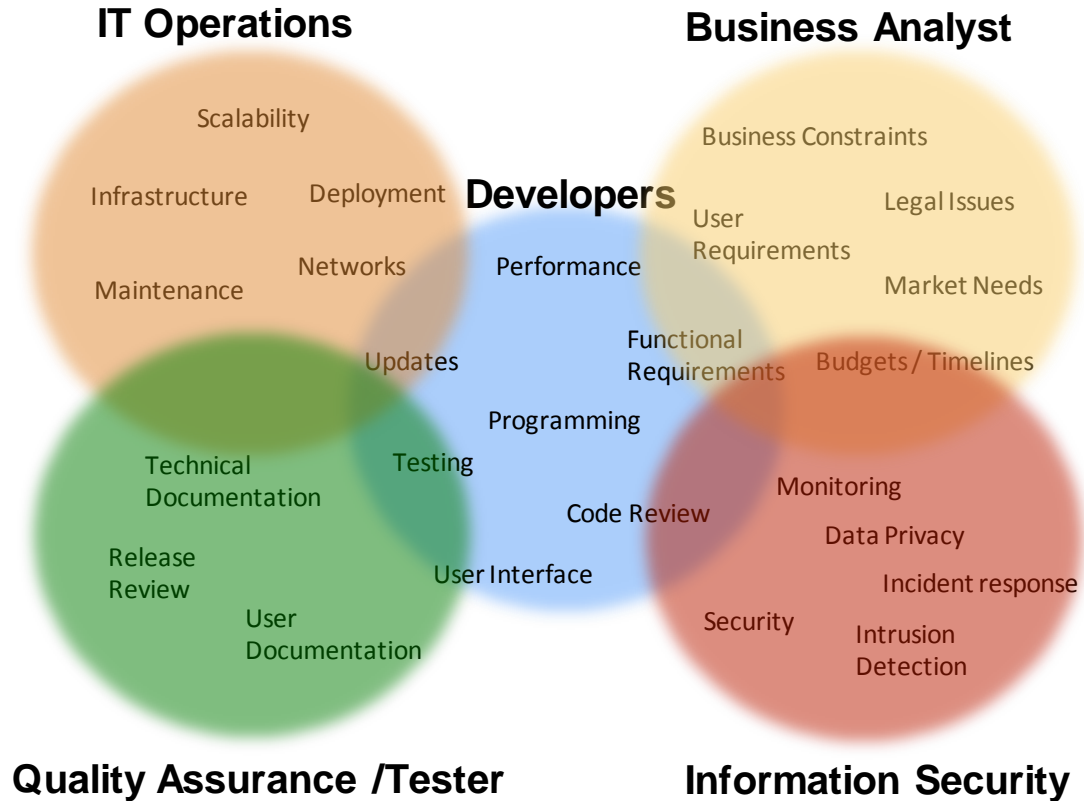
- Follow Agile methodologies
 - Using Scrum, Kanban and modern development approaches
 - Self directing, self managed, self organized
- Using any new technology
 - Each Dev has own development strategy
 - OpenSource,

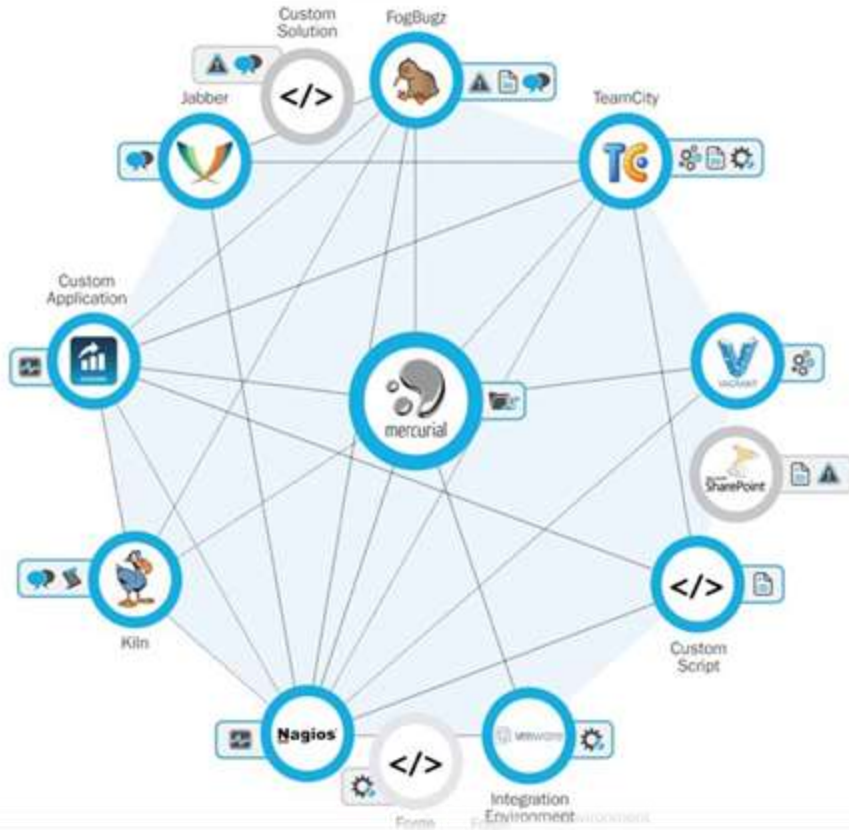
- Operations
 - Runs the application
 - Manages the infrastructure
 - Support the applications
- Operations provides
 - Service Strategy, Design, Operations
 - Secure Systems

Dev wants to deliver software faster with new requirements...

Ops wants to maintain stability, operations up-time...

It is more than Dev and Ops...





- Many tools can help you achieve your DevOps goals...
- But **don't get distracted!**
- **Integration and communication**, even among tools, is key.
- Redundant tooling is worse than no tooling at all.

DevOps is About Culture and Quality

- Early involvement of experts
 - Ops = experts in maintainability and deployability

- Complete engagement
 - Don't bring Ops Engineers in as consultants – make them first-class team members with same success criteria as devs

- Break down organizational silos
 - Enable and require constant communication

Without a Collaborative Culture, You Don't Have DevOps

Ask yourself:

- Do your Devs' know **exactly** what **actual** production looks like?
- Does Ops know how Devs package a build?
- Is it **consistent**?
- Can both Dev and Ops collaborate on server configuration and apply it automatically to both **development and production environments**?
- Do business analysts **know the cost** of feature addition or modification?
- Can project managers measure project status **at any point in time**?
- Can the customer measure project status **at any point in time**?

DevOps Requires Customization to Meet Your Unique Needs

Example: How should I configure my CI server?

- What is your project technical requirements ?
- Want 90% test coverage?
 - **Fail the build if code base is < 90% covered**
- Want all DB queries < 2sec?
 - **Test them, and fail the build otherwise**
- What does **quality** mean to your organization?

DevOps Breaks Down Silos



Effective Teams Need Dedicated Experts

- Primary attributes of your system require
 - **dedicated expert team members**
 - Security, Usability, Deployability

- DevOps does **not** mean telling developers to learn / automate operations tasks

The SDLC is Full of Decision Points

Without Ops knowledge, developers continually make uninformed decisions, causing eventual **risk** or **inefficiency**



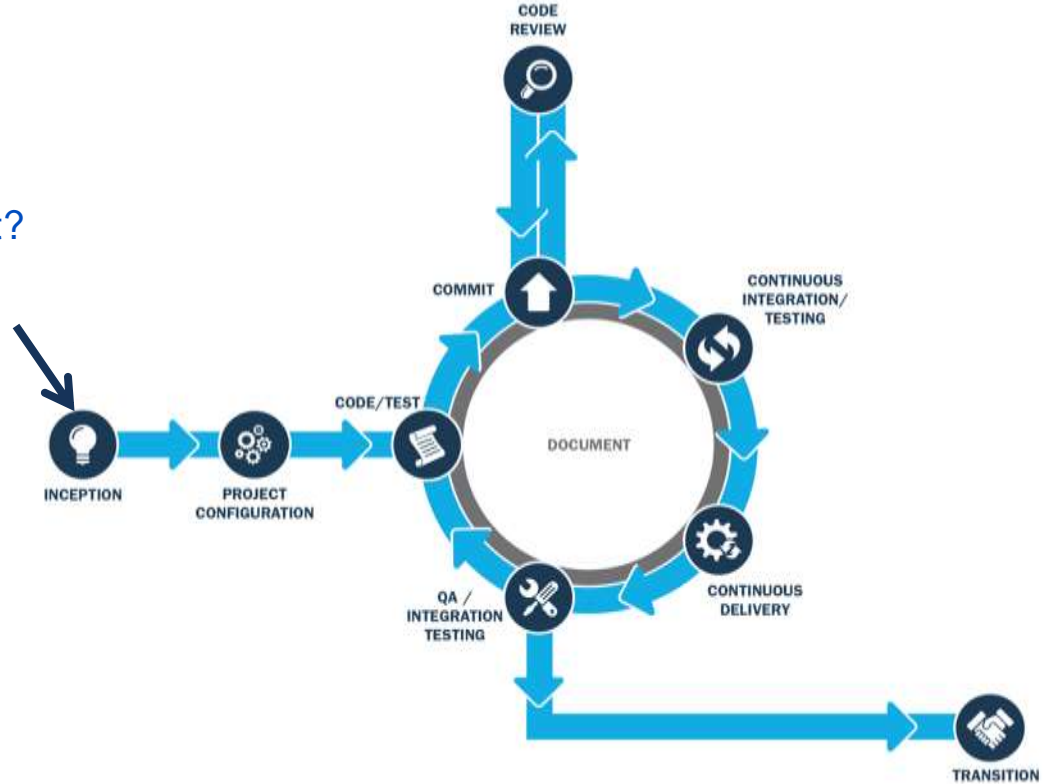
The SDLC is Full of Decision Points

How many users?

Payment model?

Who is the Target Market?

Which regions?



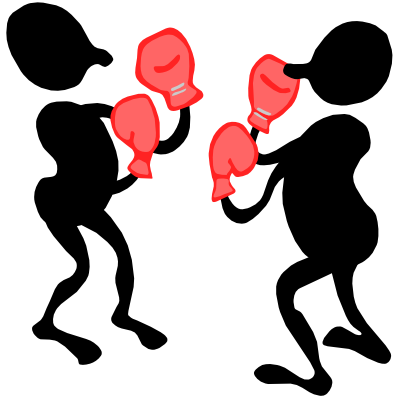
Not Everyone Needs to Achieve Continuous Deployment

- Your DevOps goals should be designed around business needs
 - Deployment frequency?
 - Production environment.
- Do frequent deployments give you a competitive edge?
- Establish traceability, visibility and collaborative environment

Continuous delivery is a software engineering practice that allows for frequent releases of new software to staging or various test environments through the use of automated testing.

Continuous deployment is the automated process of deploying changes to production by verifying intended features and validations to minimize risk.

Incentivizing Behaviors



- Blame-Free Culture
 - No Hiding of Problems
 - Culture of shared responsibility
 - Collective decision and continuous learning
- Cross-Silo Goals
 - Incentivize Collaboration
 - Reduce “Not My Job”
 - Increase Sense of Purpose
- Optimize Ease-of-Use
 - Tools: Chat, ChatOps, Wiki
 - Integrated Pipelines

Conway's Law:

“ How to organize our teams affects how we perform our work”

- Share common goals from top to bottom
- Enable business value oriented team
- Functional Team
- Share responsibilities (like Security is everyone's job)
- Keep team size small

Apply DevOps to migrate Legacy Systems

- Ancient systems should be replaced.
- Installing new systems to fit in
- Build a new version instead of maintaining
- Re-architect to support incremental and iterative development
- Enable dynamic integration of systems

Tools complexity

PERIODIC TABLE OF DEVOPS TOOLS (V2)

EMBED DOWNLOAD ADD

1 Fm Gt Git	2 En Dt Datical	3 En Bb Bitbucket	4 En Lb Liquibase	5 En Ch Chef	6 En Pu Puppet	7 Os An Ansible	8 Os Sl Salt	9 Os Dk Docker	10 Pd Az Azure	11 Fm Gt Git	12 Os Dt Datical	13 Os Bb Bitbucket	14 Os Lb Liquibase	15 En Ch Chef	16 En Pu Puppet	17 Os An Ansible	18 Os Sl Salt	19 Os Dk Docker	20 Pd Az Azure	21 En Gt GitLab	22 En Rg Redgate	23 Os Mv Maven	24 Os Gr Gradle	25 Os At ANT	26 Os Fn FitNesse	27 Fr Se Selenium	28 Os Ga Gatling	29 Fr Dh Docker Hub	30 Os Jn Jenkins	31 Pd Ba Bamboo	32 Os Tr Travis CI	33 Pd Gd Deployment Manager	34 Os Sf SmartFrog	35 Os Cn Consul	36 Os Bc Bcf2	37 Os Mo Mesos	38 En Rs Rackspace	39 Os Sv Subversion	40 En Dm DBmaestro	41 Os Gn Grunt	42 Os Gp Gulp	43 Os Br Broccoli	44 Fr Cu Cucumber	45 Fr Cj Cucumber.js	46 Fr Qu Qunit	47 Os Npm npm	48 Fm Cs Codeship	49 Pd Vs Visual Studio	50 Fm Cr CircleCI	51 Fr Cp Capistrano	52 Fr Ju Jujju	53 Os Rd Rundeck	54 Os Cf CFEngine	55 Fr Ds Swarm	56 Os Op OpenStack	57 Os Hg Mercurial	58 En Dp Delphix	59 Fr Sb sbt	60 Os Mk Maka	61 Os Ck CMake	62 Os Jt JUnit	63 Fr Jm JMeter	64 Fr Tn TestNG	65 Os Ay Artifactory	66 Fm Tc TeamCity	67 Fm Sh Shippable	68 Os Cc CruiseControl	69 En Ry RapidDeploy	70 En Cy CodeDeploy	71 En Oc Octopus Deploy	72 En No CA Nolio	73 Os Kb Kubernetes	74 Fm Hr Heroku	75 En Cw CSPW	76 En Id Idera	77 Os Msb MSBuild	78 Os Rk Rake	79 Fr Pk Packer	80 Os Mc Mocha	81 Fr Km Karma	82 Os Jm Jasmine	83 Os Nx Nexus	84 Os Co Continuum	85 Fm Ct Continua CI	86 En So Solano CI	87 En Xld XL Deploy	88 En EB ElasticBox	89 Fm Dp Deploybot	90 En Ud UrbanCode Deploy	91 Os Nm Nomad	92 En Os Os OpenShift
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SCM	Database Mgmt	Build
CI	Repo Mgmt	Testing
Deployment	Config / Provisioning	Containerization
Cloud / IaaS / PaaS	Release Mgmt	Collaboration
BI / Monitoring	Logging	Security



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Publication Guidelines

91 En Xlr XL Release	92 En Ur UrbanCode Release	93 En Bm BMC Release	94 En Ca CA Release Automation	95 En Au Automic	96 En Pl Plutora Release	97 En Sr Micro Focus Release	98 Pd Tfs Team Foundation	99 Fm Tl Trello	100 Pd Jr Jira	101 Fm Rf HipChat	102 Fm Sl Stack	103 Fm Fd Flowdock	104 Pd Pv Pivotal Tracker	105 En Sn ServiceNow	106 Os Ki Kibana	107 Fm Nr New Relic	108 En Dt Dynatrace	109 Os Ni Nagios	110 Os Zb Zabbix	111 En Dd Datadog	112 Os El Elasticsearch	113 Fm Ad AppDynamics	114 En Sp Splunk	115 Fm Le Logentries	116 Fm Sl Sumo Logic	117 Os Ls Logstash	118 Os Sn Short	119 Os Tw Tripwire	120 En Ff Fortify Webspect
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Tools Quality Attributes

- Integrate-ability
- Interoperability
- Usability
- Portability
- Resilience
- Security/Permissions
- Availability (Error handling)
- Scalability
- Performance
- Modifiability
- Configurability
- “Automate-ability” (of manual tasks)
- “Approvability” (allows for manual approval)
- Measurability?
- Other?

Decide what to measure

- Deployment frequency
- Lead time
- # of work items (tickets)
- Defect escape rate
- Mean time to detection (MTTD)
- Mean time to recovery (MTTR)
- Application performance

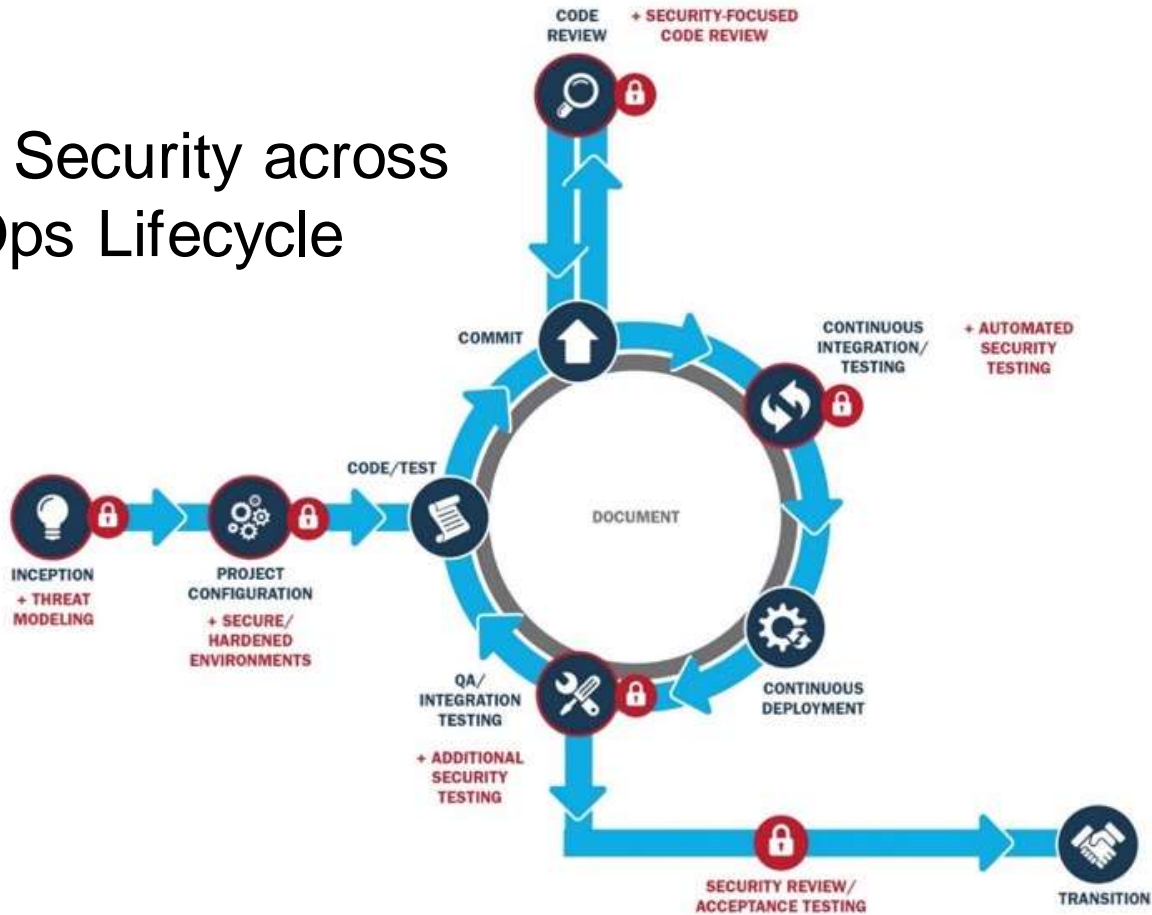
DevOps Enabler..

Establish a process to enable people to succeed using the platform to develop Secure application

Such that;

- Constant communication and visible to all
- Ensures that tasks are testable and repeatable
- Frees up human experts to do challenging, creative work
- Allows tasks to be performed with minimal effort or cost
- Creates confidence in task success, after past repetitions
- Faster deployment , frequent quality release

Integrate Security across DevOps Lifecycle



For more information...

DevOps: <https://www.sei.cmu.edu/go/devops>

DevOps Blog: <https://insights.sei.cmu.edu/devops>

Webinar : <https://www.sei.cmu.edu/publications/webinars/index.cfm>

Podcast : <https://www.sei.cmu.edu/publications/podcasts/index.cfm>

Thank You

Hasan Yasar

Technical Director, Adjunct Faculty Member
Continuous Deployment of Capability

hyasar@sei.cmu.edu

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