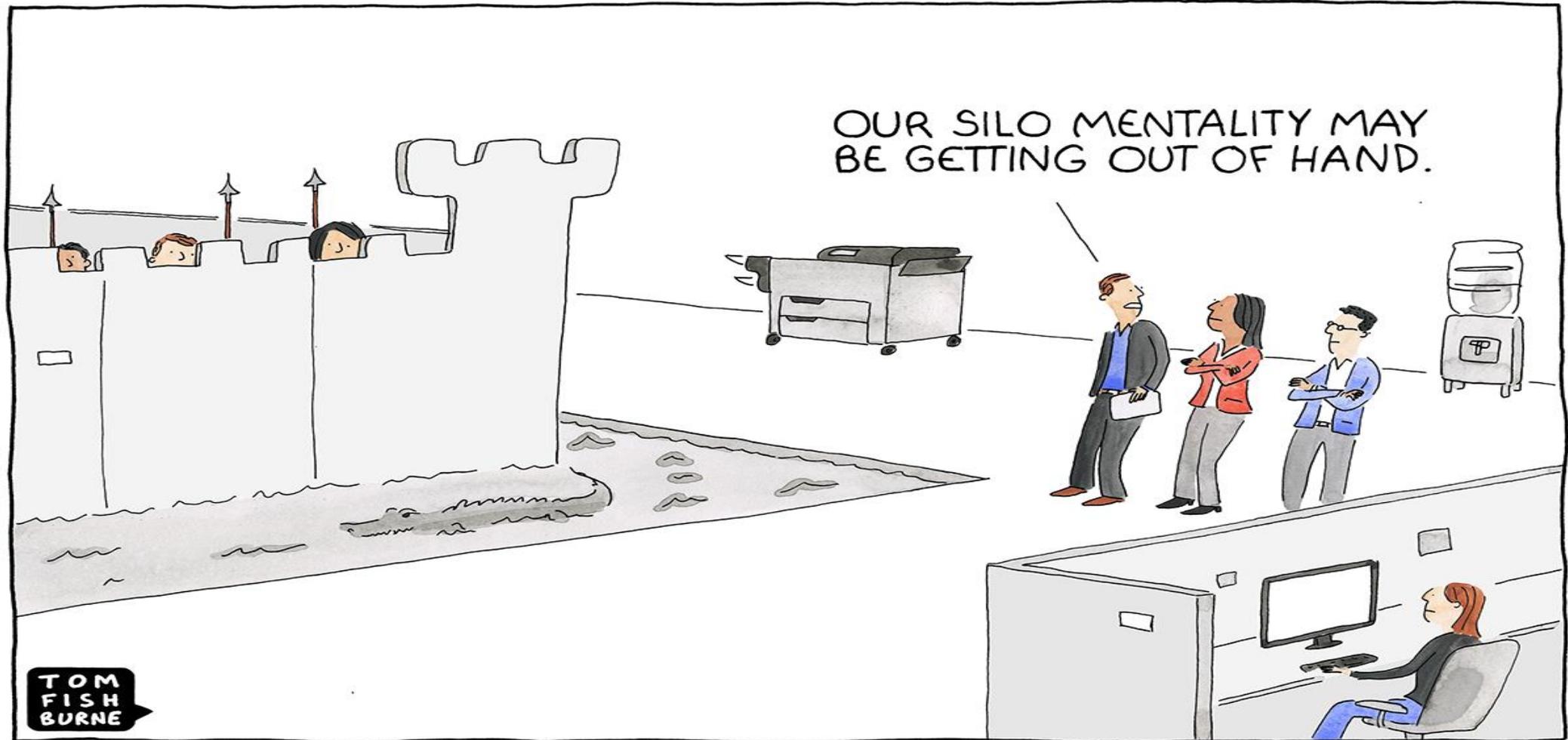


# Culture



© marketoonist.com

# The DevOps promise...



**ACCELERATE**  
software  
delivery



**BALANCE**  
speed, cost,  
quality  
and risk



**REDUCE**  
time  
to customer  
feedback

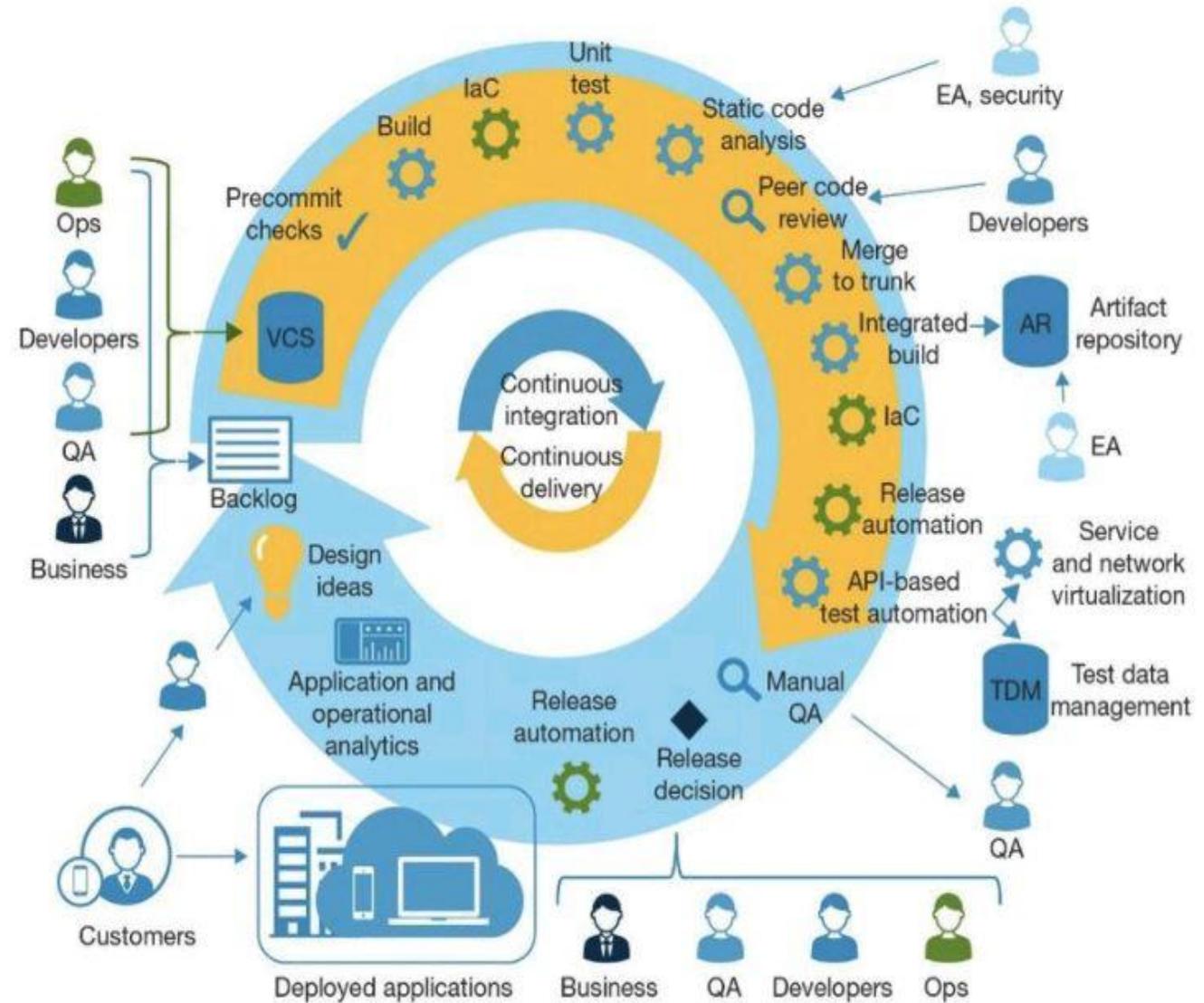
## What is DevOps?

DevOps means people, process, and the right tools working together to make the value delivery lifecycle faster and more predictable.



# DevOps

Automate each step in the software delivery pipeline



# DevOps



Business



**Agile  
Development**

- Iterative Development
- Scrum, Sprint, Stories
- Velocity

Business  
Agility



Developers  
(application)



**DevOps**

- Continuous Integration
- Continuous Deployment
- IT Automation
- Application Management

IT Agility



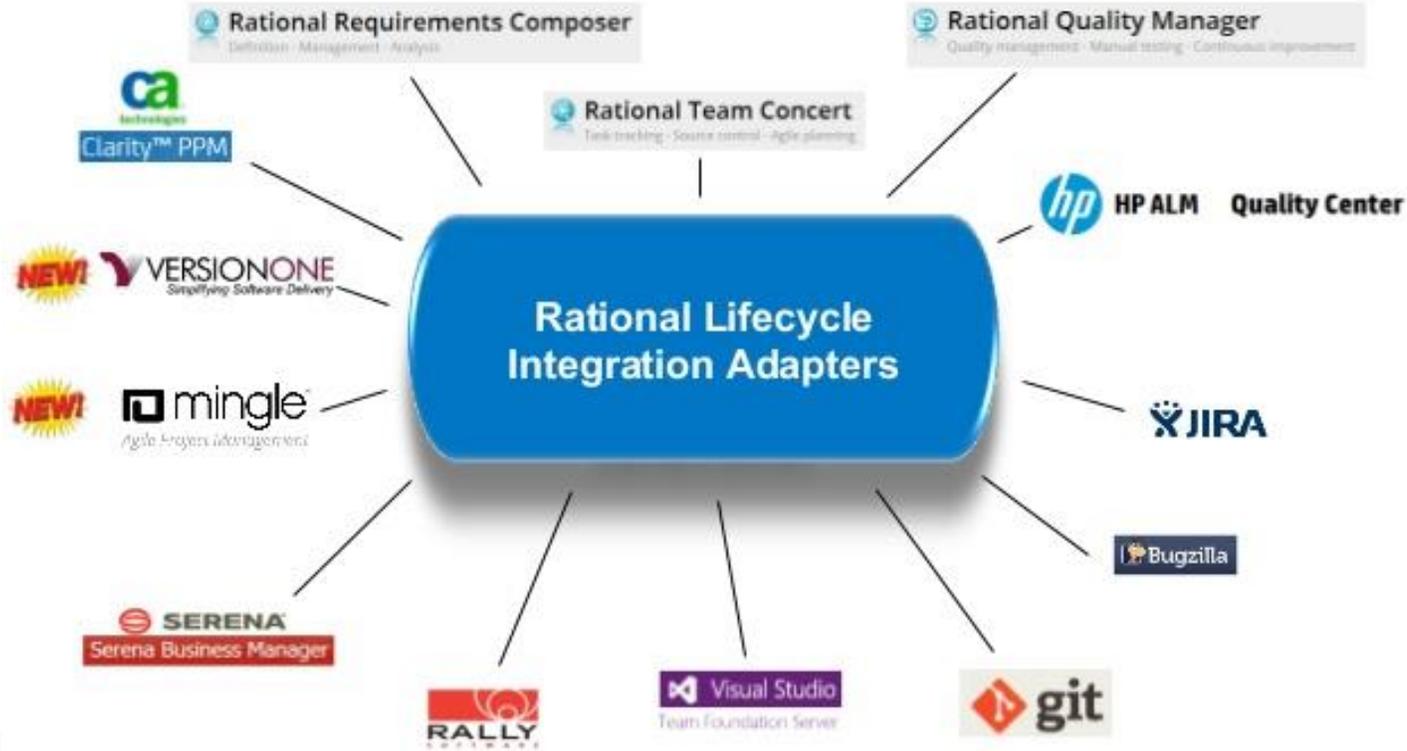
IT Operations



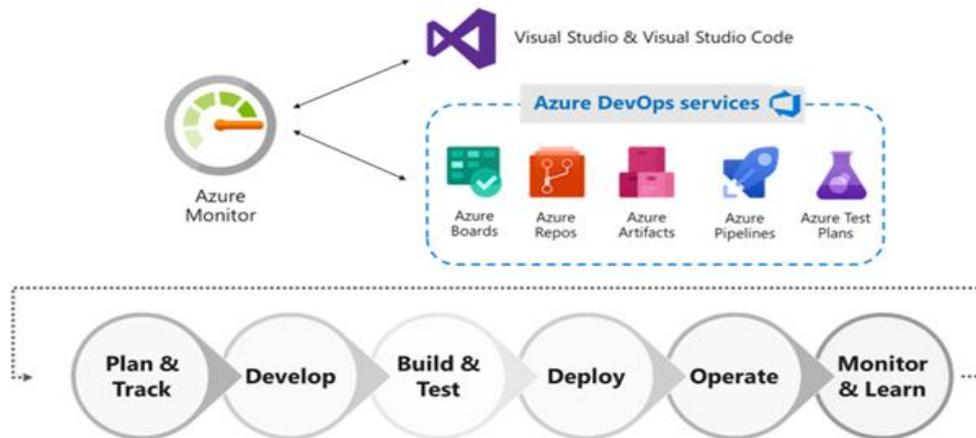
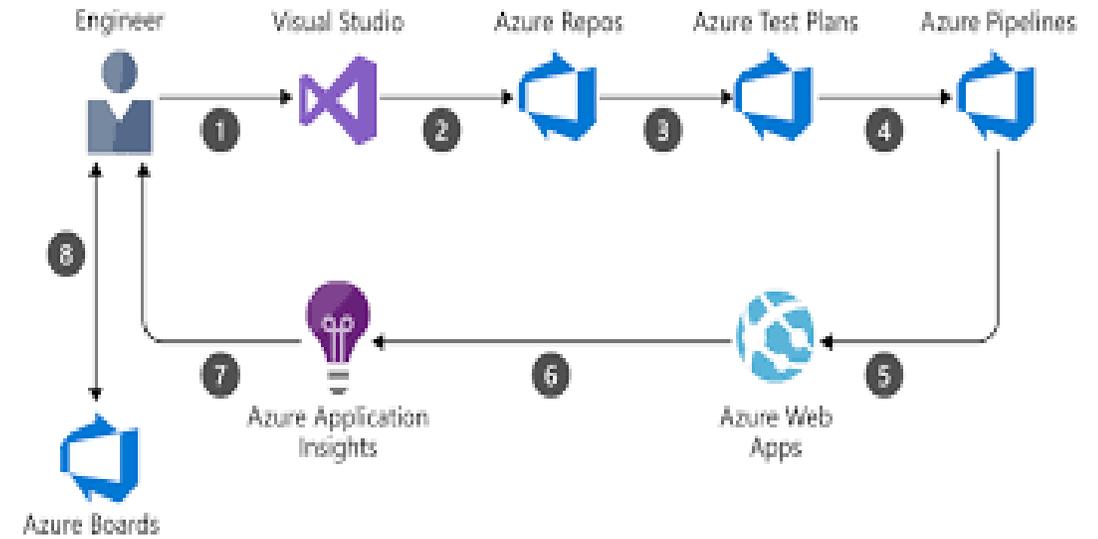
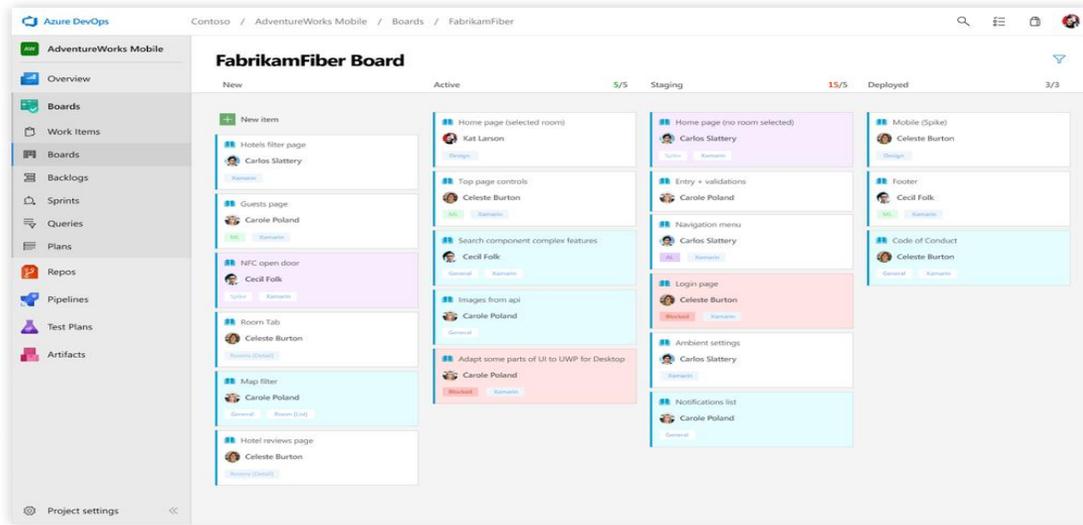
# IBM DevOps Tooling



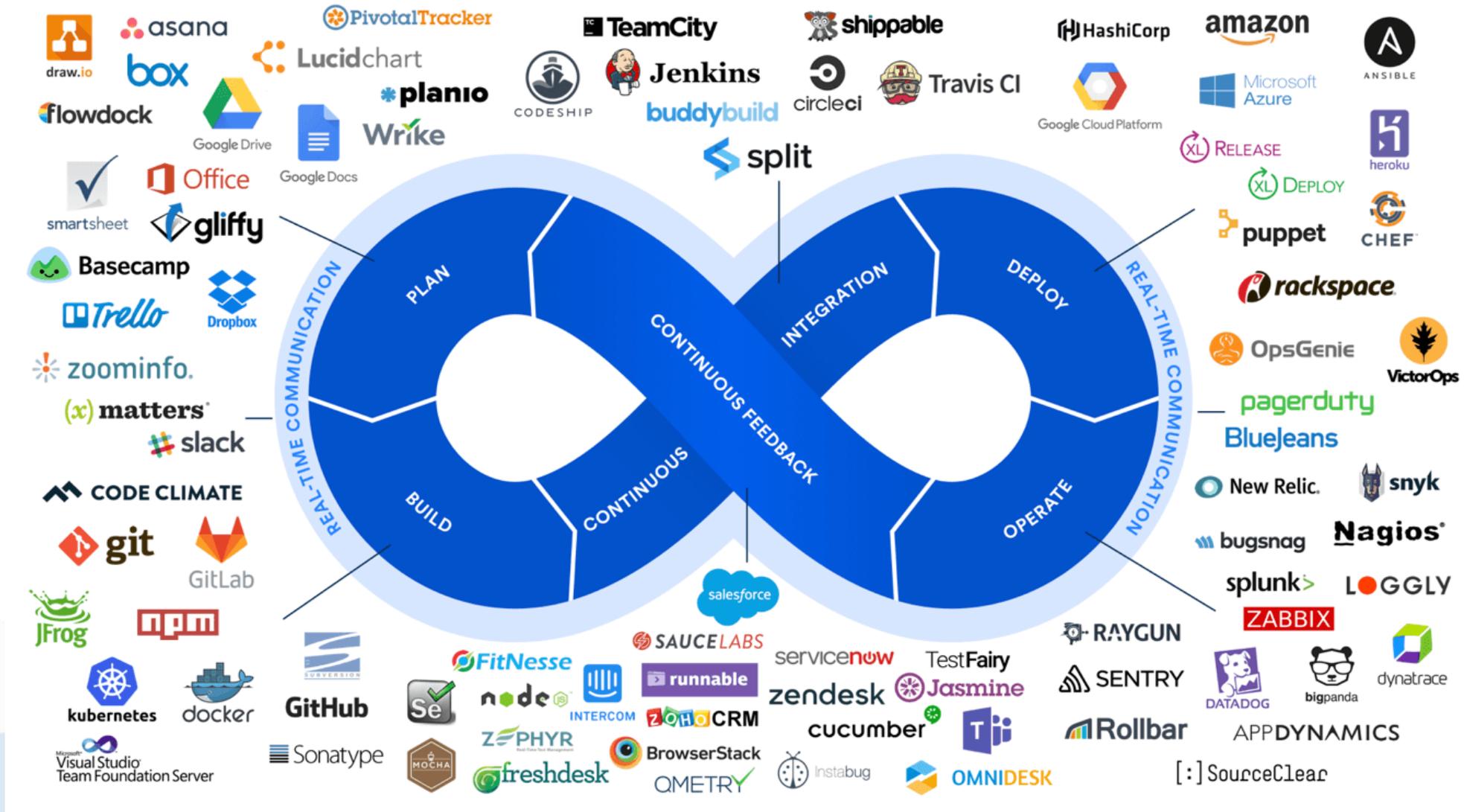
## Announcing IBM Rational Lifecycle Integration Adapters v1.1.2 *Integrating Rational products with 3<sup>rd</sup>-party tools*



# What about Azure DevOps?



# DevOps Tooling



# XebiaLabs Periodic Table

**PERIODIC TABLE OF DEVOPS TOOLS (V3)**

1 Os <b>GI</b> GITLab																2 En <b>Sp</b> Splunk						
3 Fm <b>Gh</b> GitHub	4 En <b>Dt</b> Datical																5 En <b>XLr</b> XebiaLabs XL Release	6 Fm <b>Aws</b> AWS	7 Pd <b>Az</b> Azure	8 En <b>Gc</b> Google Cloud	9 Fm <b>Op</b> OpenShift	10 Fm <b>Sg</b> Sumo Logic
11 Os <b>Sv</b> Subversion	12 En <b>Db</b> DBMaestro																13 Os <b>Dk</b> Docker	14 En <b>Ur</b> UrbanCode Release	15 Pd <b>Af</b> Azure Functions	16 Pd <b>Ld</b> Lambda	17 Fm <b>Ic</b> IBM Cloud	18 Os <b>Fd</b> Fluentd
19 En <b>Cw</b> ISPW	20 En <b>Dp</b> Delphix	21 Os <b>Jn</b> Jenkins	22 Fm <b>Cs</b> Codeship	23 Os <b>Fn</b> FITNesse	24 Fr <b>Ju</b> JUnit	25 Fr <b>Ka</b> Karma	26 Fm <b>Su</b> SoapUI	27 En <b>Ch</b> Chef	28 Fr <b>Tf</b> Terraform	29 En <b>XLd</b> XebiaLabs XL Deploy	30 En <b>Ud</b> UrbanCode Deploy	31 Os <b>Ku</b> Kubernetes	32 Fm <b>Cc</b> CA CD Director	33 En <b>Pr</b> Pivotal Release	34 Pd <b>Al</b> Alibaba Cloud	35 Os <b>Os</b> OpenStack	36 Os <b>Ps</b> Prometheus					
37 Pd <b>At</b> Artifactory	38 Fm <b>Rg</b> Redgate	39 Pd <b>Ba</b> Bamboo	40 Fm <b>Vs</b> VSTS	41 Fr <b>Se</b> Selenium	42 Fr <b>Jm</b> JMeter	43 Os <b>Ja</b> Jasmine	44 Pd <b>Sl</b> Sauce Labs	45 En <b>An</b> Ansible	46 Os <b>Ru</b> Rudder	47 En <b>Oc</b> Octopus Deploy	48 Os <b>Go</b> GoCD	49 Os <b>Ms</b> Mesos	50 Pd <b>Gke</b> GKE	51 Fm <b>Om</b> OpenMake	52 Pd <b>Cp</b> AWS CodePipeline	53 Pd <b>Cy</b> Cloud Foundry	54 En <b>It</b> ITRS					
55 Pd <b>Nx</b> Nexus	56 Os <b>Fw</b> Flyway	57 Os <b>Tr</b> Travis CI	58 Fm <b>Tc</b> TeamCity	59 Os <b>Ga</b> Gatling	60 Fr <b>Tn</b> TestNG	61 Fm <b>Tt</b> Tricentis Tosca	62 Pd <b>Pe</b> Perfecto	63 En <b>Pu</b> Puppet	64 Os <b>Pa</b> Packer	65 Fm <b>Cd</b> AWS CodeDeploy	66 En <b>Ec</b> ElectricCloud	67 Os <b>Ra</b> Rancher	68 Pd <b>Aks</b> AKS	69 Os <b>Rk</b> Rkt	70 Os <b>Sp</b> Spinnaker	71 Pd <b>Ir</b> Iron.io	72 Pd <b>Mg</b> Moogsoft					
73 Fm <b>Bb</b> BITBucket	74 En <b>Pf</b> Perforce	75 Fm <b>Cr</b> Circle CI	76 Pd <b>Cb</b> AWS CodeBuild	77 Fr <b>Cu</b> Cucumber	78 Os <b>Mc</b> Mocha	79 Os <b>Lo</b> Locust.io	80 En <b>Mf</b> Micro Focus UFT	81 Os <b>Sa</b> Salt	82 Os <b>Ce</b> CFEngine	83 En <b>Eb</b> ElasticBox	84 En <b>Ca</b> CA Automic	85 En <b>De</b> Docker Enterprise	86 Pd <b>Ae</b> AWS ECS	87 Fm <b>Cf</b> Codefresh	88 Os <b>Hm</b> Helm	89 Os <b>Aw</b> Apache OpenWhisk	90 Os <b>Ls</b> Logstash					

<b>Os</b> Open Source	<b>Fr</b> Free	<b>Fm</b> Freemium	<b>Pd</b> Paid	<b>En</b> Enterprise	<b>Source Control Mgmt.</b>	<b>Database Automation</b>	<b>Continuous Integration</b>	<b>Testing</b>	<b>Configuration</b>	<b>Deployment</b>	<b>Containers</b>	<b>Release Orchestration</b>	<b>Cloud</b>	<b>AIOps</b>	<b>Analytics</b>	<b>Monitoring</b>	<b>Security</b>	<b>Collaboration</b>
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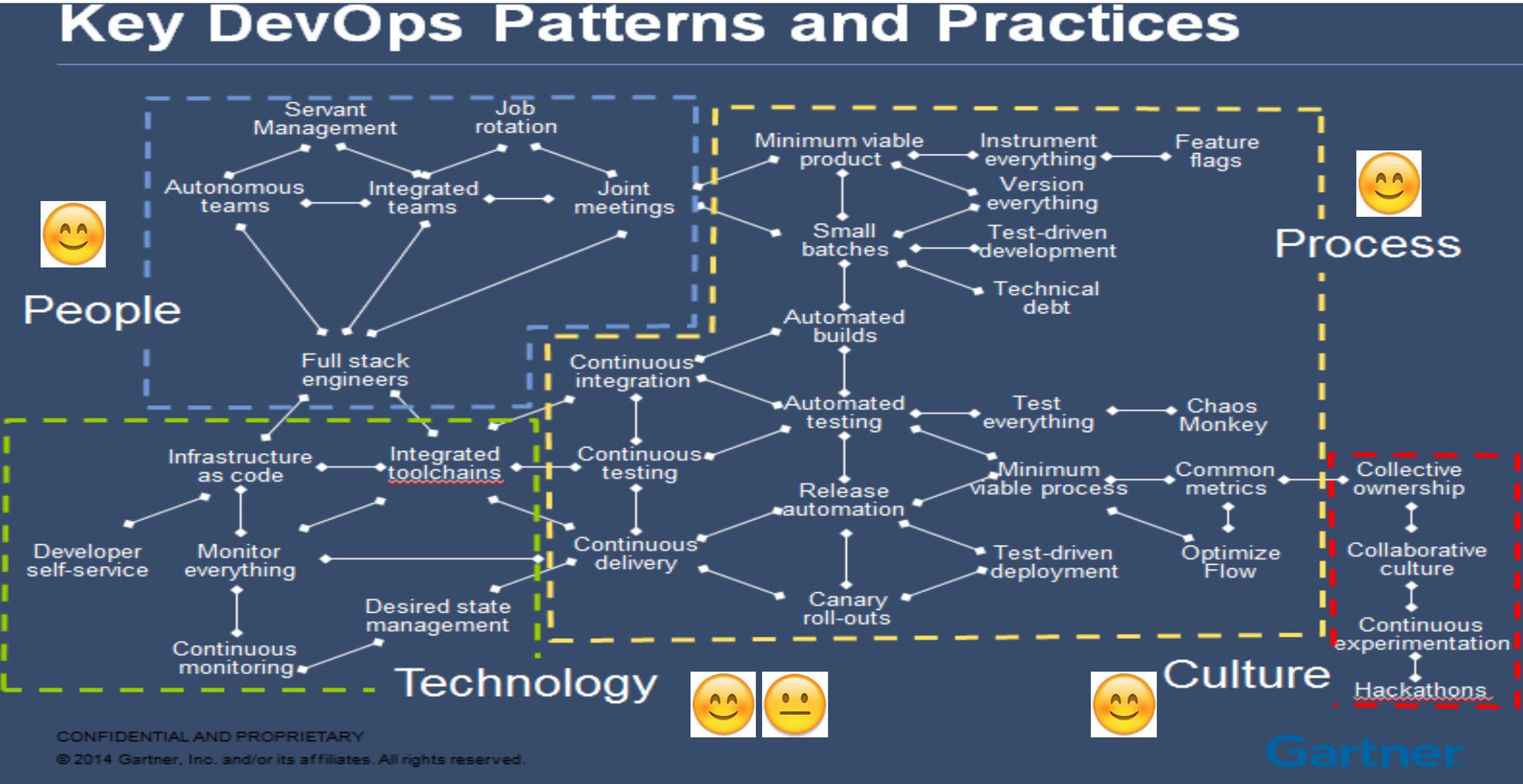
**XebiaLabs**  
Enterprise DevOps

Follow @xebialabs

91 En <b>XLi</b> XebiaLabs XL Impact	92 Os <b>Ki</b> Kibana	93 Fm <b>Nr</b> New Relic	94 En <b>Dt</b> Dynatrace	95 En <b>Dd</b> Datadog	96 Fm <b>Ad</b> AppDynamics	97 Os <b>EI</b> ElasticSearch	98 Os <b>Ni</b> Nagios	99 Os <b>Zb</b> Zabbix	100 En <b>Zn</b> Zenoss	101 En <b>Cx</b> Checkmarx SAST	102 En <b>Sg</b> Signal Sciences	103 En <b>Bd</b> BlackDuck	104 Os <b>Sr</b> SonarQube	105 Os <b>Hv</b> HashiCorp Vault
106 En <b>Sw</b> ServiceNow	107 Pd <b>Jr</b> Jira	108 Fm <b>Tl</b> Trello	109 Fm <b>Sk</b> Slack	110 Fm <b>St</b> Stride	111 En <b>Cn</b> CollabNet VersionOne	112 En <b>Ry</b> Remedy	113 En <b>Ac</b> Agile Central	114 Pd <b>Og</b> OpsGenie	115 Pd <b>Pd</b> Pagerduty	116 Os <b>Sn</b> Snort	117 Fm <b>Tw</b> Tripwire	118 En <b>Ck</b> CyberArk	119 En <b>Vc</b> Veracode	120 Os <b>Ff</b> Fortify SCA



# DevOps Patterns and Best Practice



# ARCAD SOFTWARE



## The DevOps Playing Field

The Tools of Ignorance in DevOps on IBM i & multi-platform

# Disclaimer-If it ain't broke.....



**The most dangerous phrase  
in the language is 'we've  
always done it this way.'**

**– Grace Hopper**



# Today's Speaker



Floyd Del Muro

Technology and DevOps Advocate

P: 610-810-4029



ARCAD Software - USA

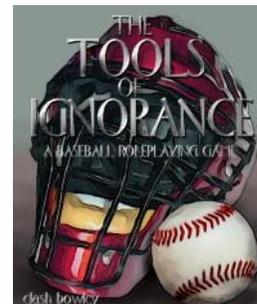
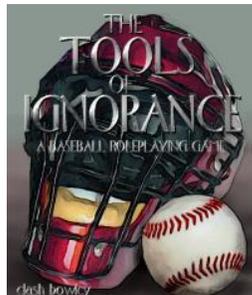
Worldwide: +33 450 578 396

Website: [www.arcadsoftware.com](http://www.arcadsoftware.com)



# AGENDA

- about DevOps
- the History and facts
  - Faster and with less issues
- Tools, Process and People
- Faster time to production, the business
- Minimize risk and downtime
- Transition to CI/CD on IBMi



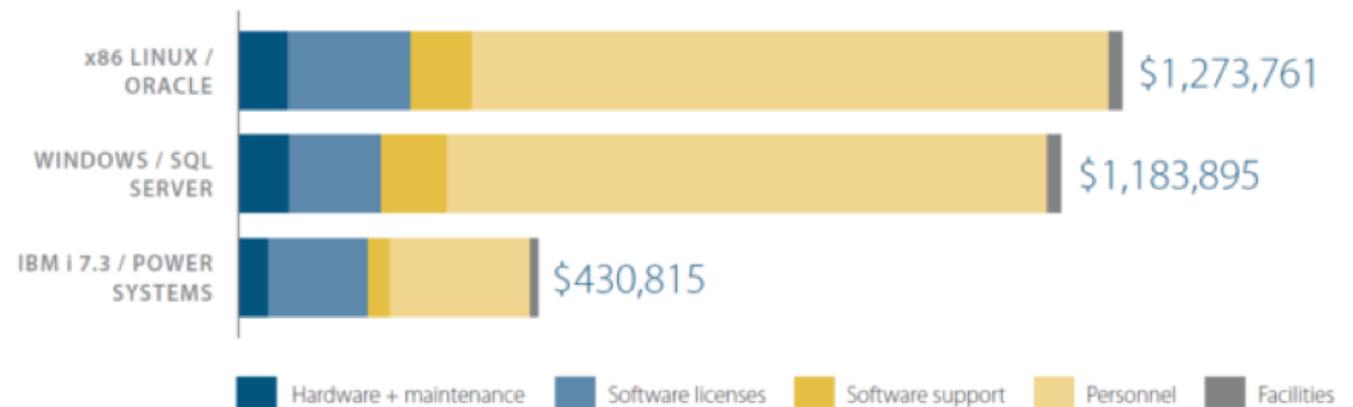
# Facts

## Characteristics of IBM i (aka iSeries, AS/400)

- Renowned stable, secure, reliable environment
- Highly affordable (the best TCO in the world (\*))
- Running business critical applications

(\* ) Quark & Lepton 2017

FIGURE 1: Three-year Costs by Platform—Averages for All Installations



SOURCE: Quark + Lepton (August 2017)

# Facts

“Legacy” systems are responsible for >70% of the world’s business transactions

Translation...the world runs on COBOL... and RPG.... and this will not change for the foreseeable future...will it be a bottleneck or an asset?



# Facts.

By 2023, 75% of global enterprises will have implemented at least one application release orchestration (ARO) solution, which is a substantial increase from fewer than 20% today.

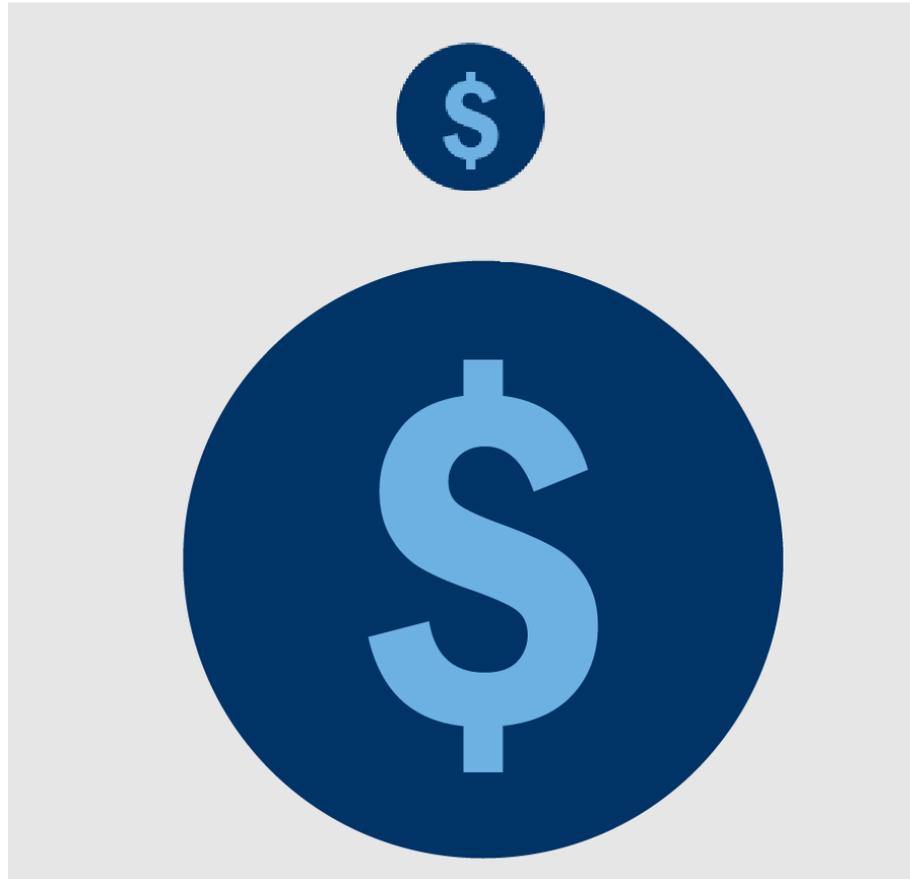
Source: Gartner 2018



DevOps on Legacy platforms  
(i and Z) Adoption rate:

- 15% 2017
- 50% by 2020

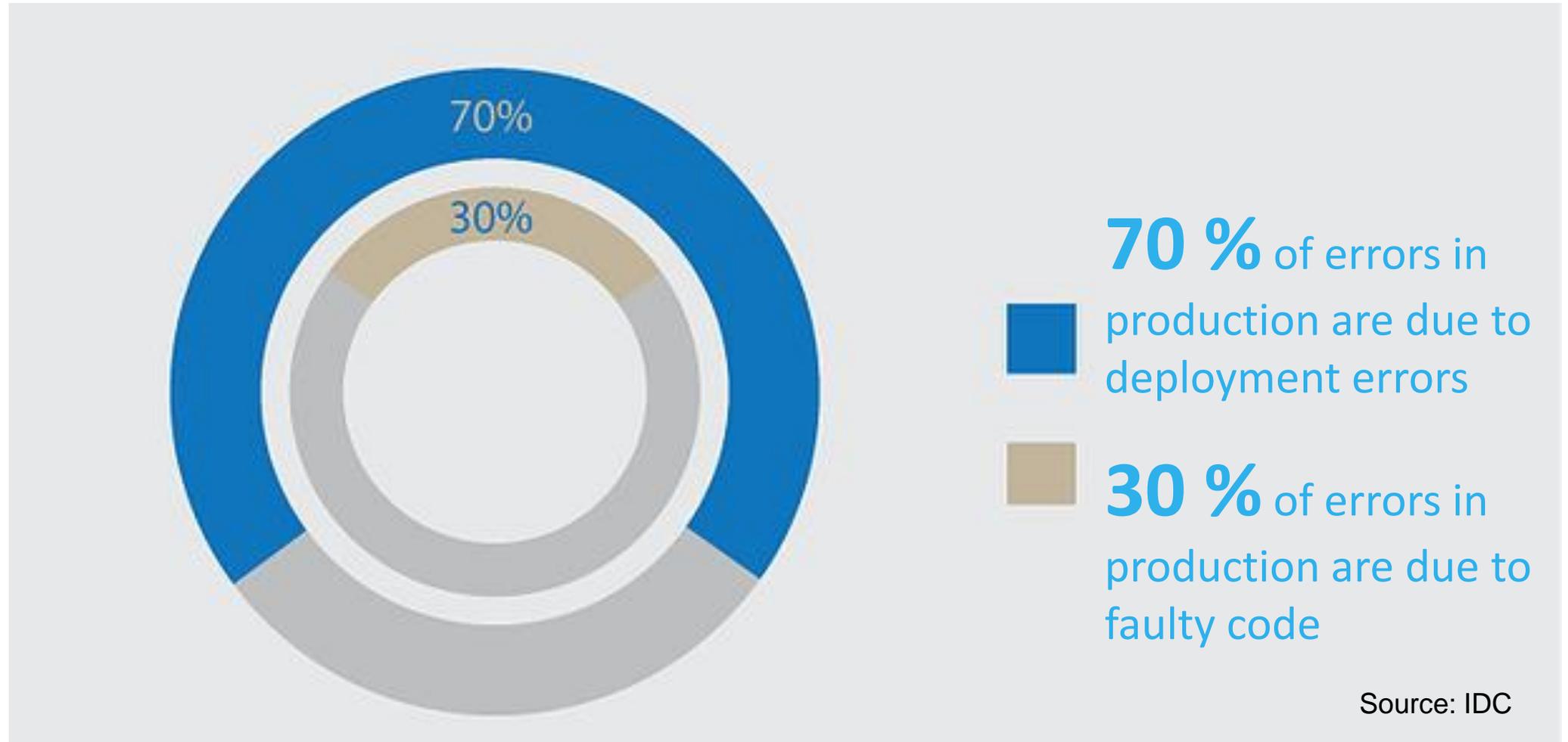
# Software vs. Hardware incidents



**100 K\$** - Average cost of hardware malfunction per hour

**1 M\$** - Average cost of a major incident in a strategic software application in production per hour

# Causes of software defect in production



# DevOps reduces errors by half



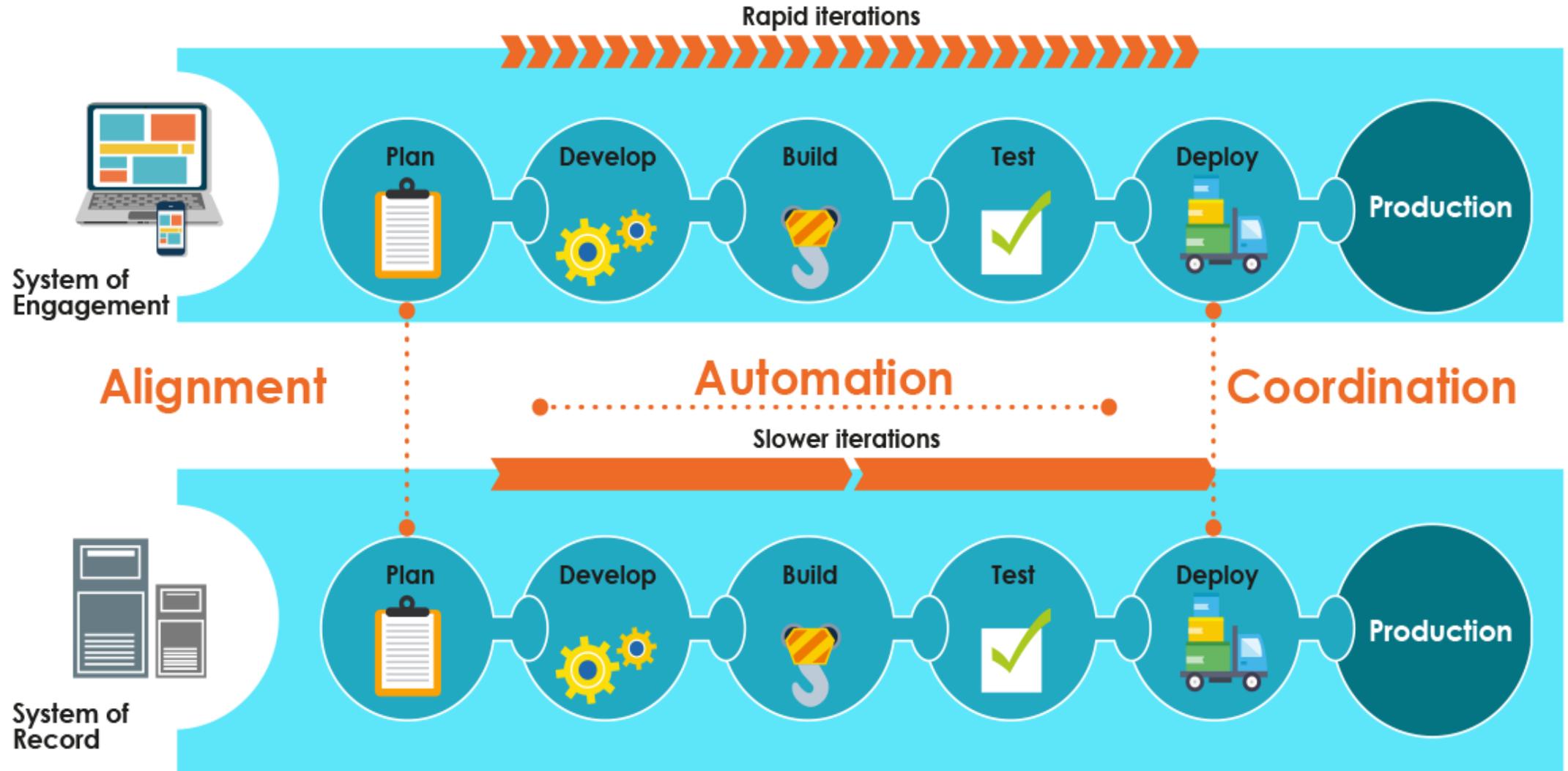
**30x** increase in the frequency of deployments



**50%** Less errors during transfers to production

Source: IDC

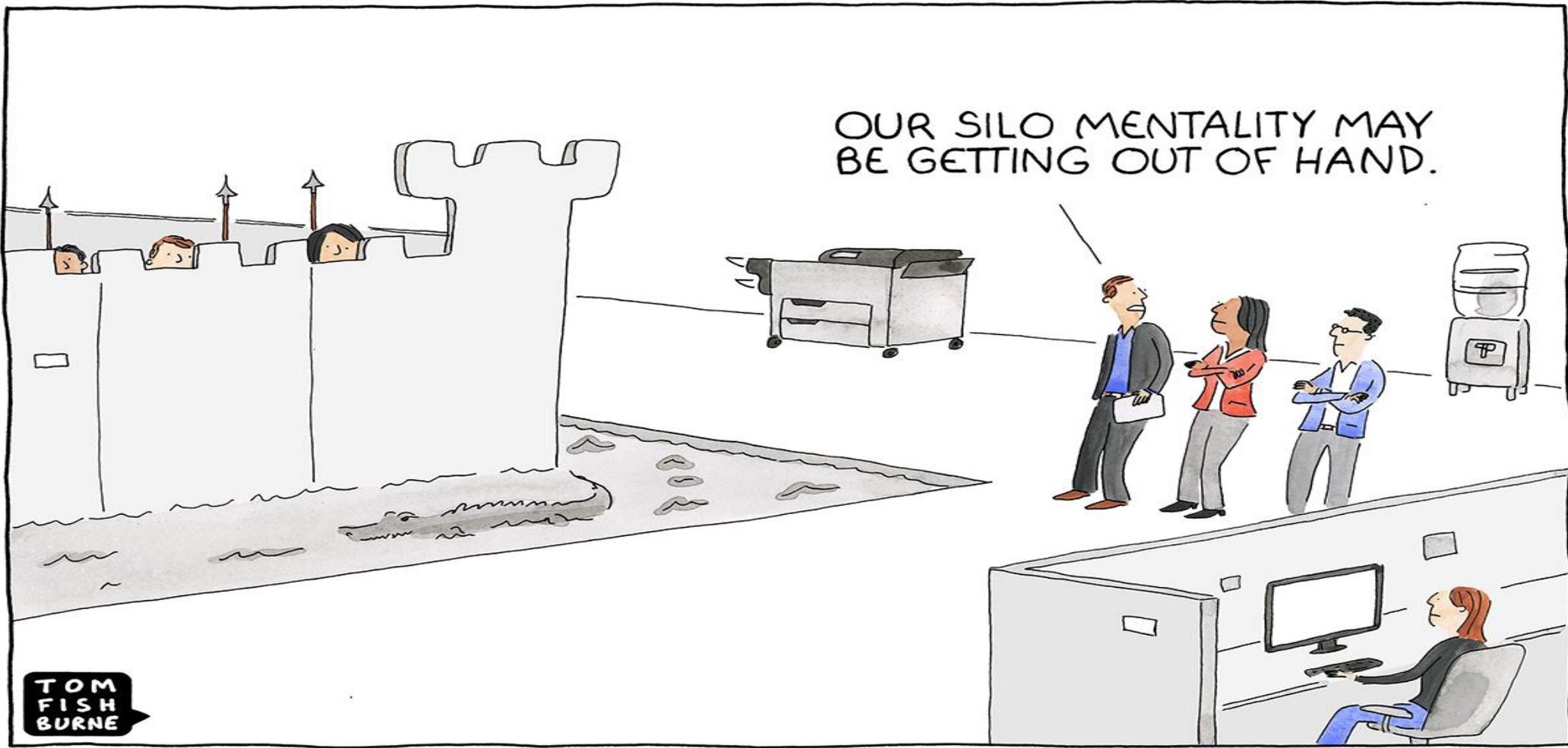
# Bimodal IT- Hybrid Development



# Bimodal IT

	System of Record	System of Engagement
Applications	Legacy/high volume	Modern/small
Speed of change	Slow	Rapid
Methodology	Waterfall	Agile
Skills	Specialized	"Jack of all trades"
Collaboration	Silos	Collaborative
	Managed by IT department	External ecosystem

# IBM i Culture



© marketoonist.com

# Bimodal IT

**Larger enterprises** often face challenges when extending DevOps enterprise-wide: But not Always!

- Differences in technology cultures between “Systems of Engagement” (SoE) and “Systems of Record” (SoR) reduces DevOps effectiveness overall.
- Each culture has their own tool pipeline with little or no sharing of data. \$\$\$
- Delivery frequency and development speed is often radically different between distributed and legacy teams.

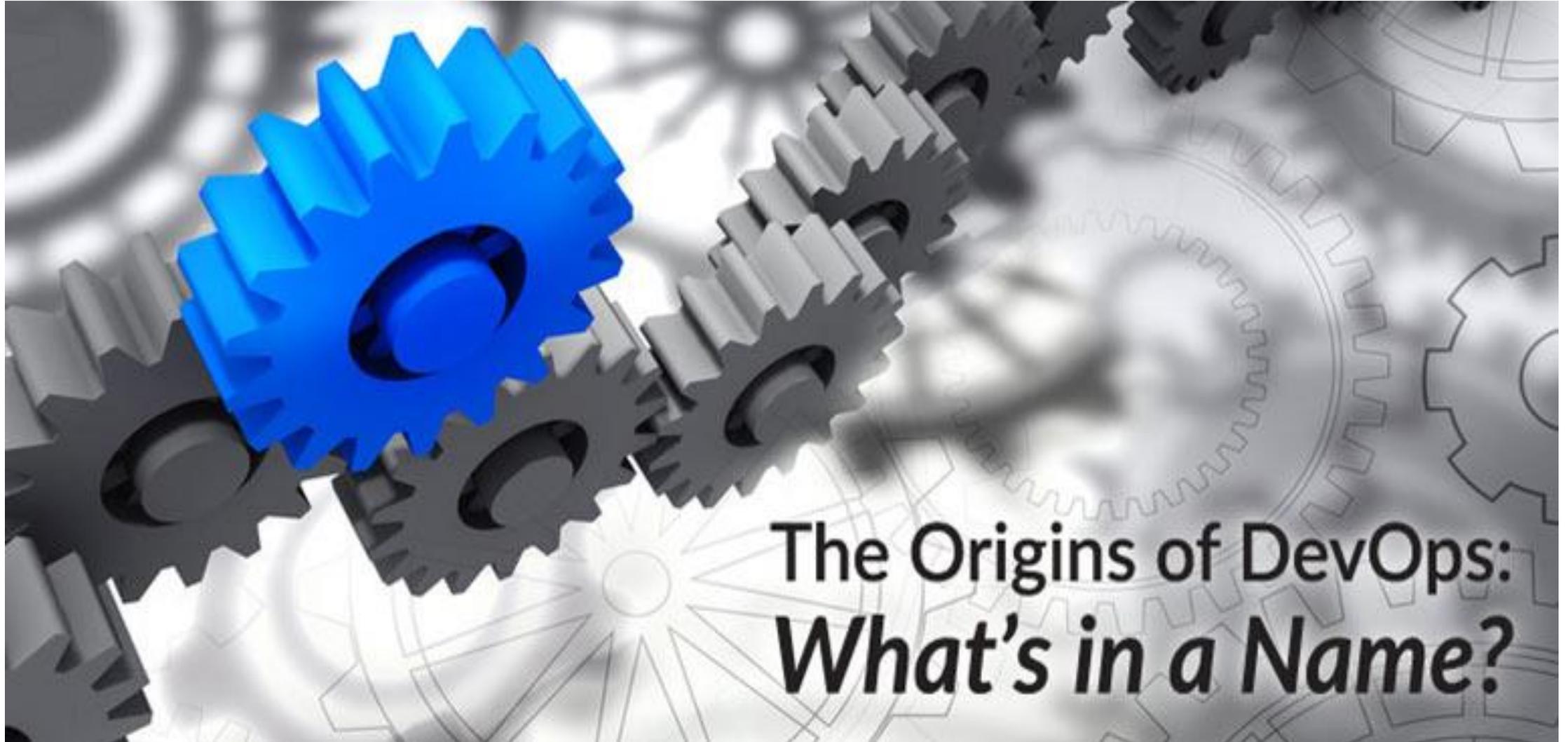
**To avoid bottlenecks, DevOps tools must tie ALL these specific technologies together.**



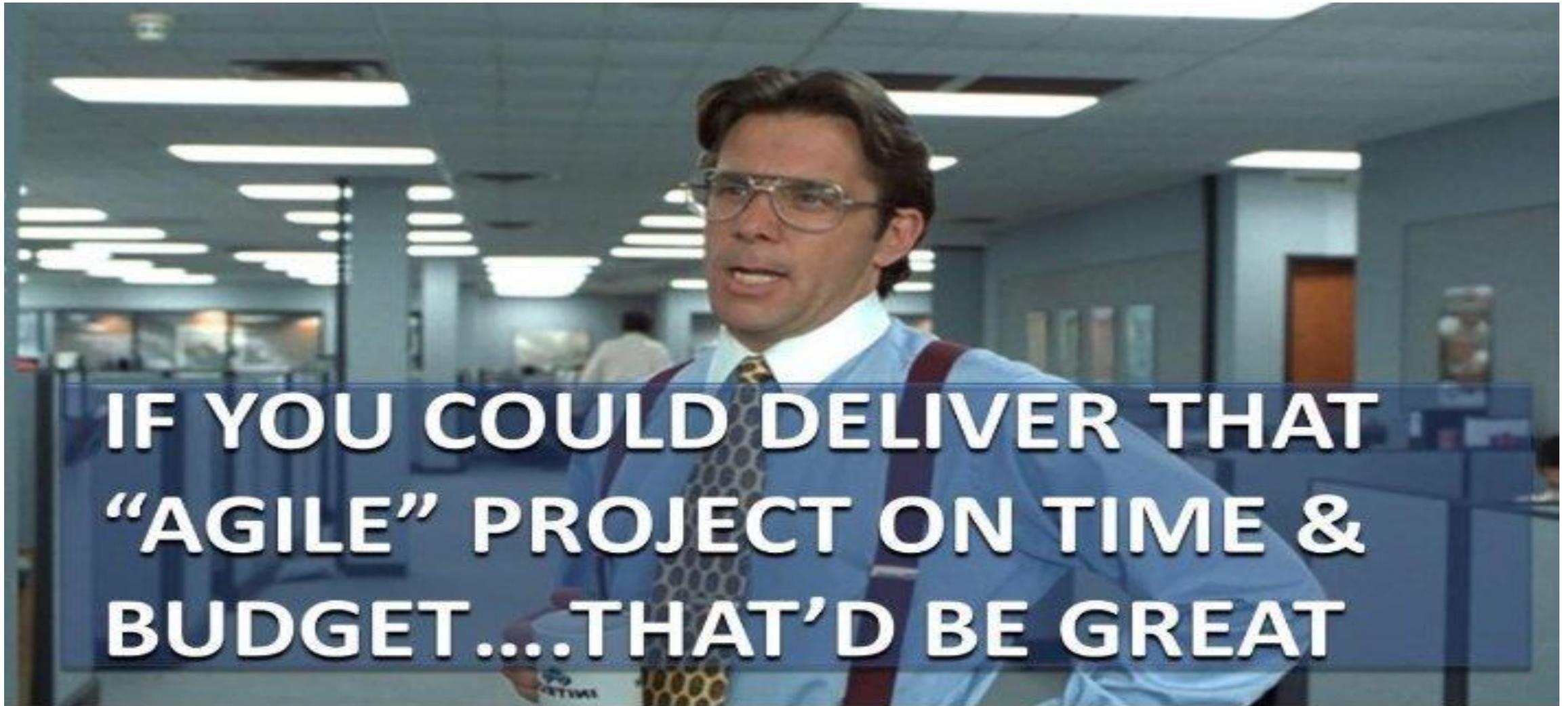
# DevOps History and Concepts

Becoming Agile...

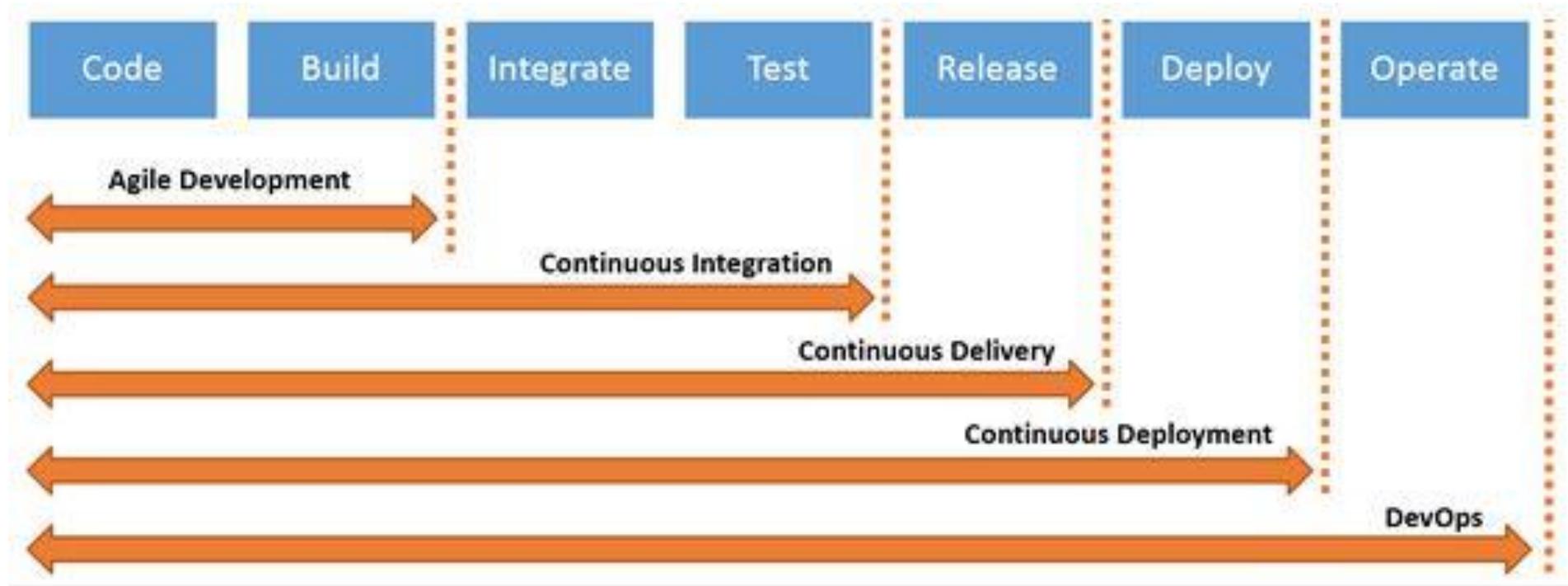
# Lean Manufacturing of Software



# Agile vs DevOps



# Agile vs DevOps and More



# Agile vs DevOps and More

## PROJECT EXECUTION METHODOLOGIES – THE CHANGE

### WATERFALL



### AGILE



### DEVOPS



# DevOps with the Business



Business



**Agile Development**

- Iterative Development
- Scrum, Sprint, Stories
- Velocity

Business Agility



Developers  
(application)



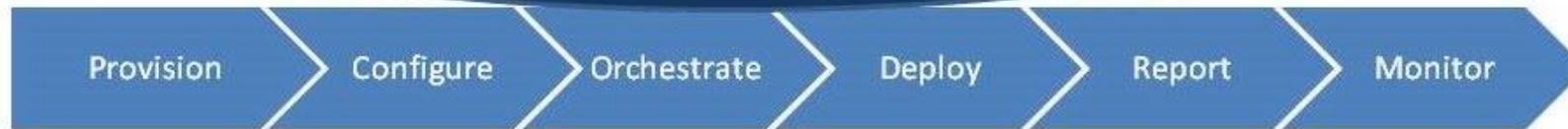
**DevOps**

- Continuous Integration
- Continuous Deployment
- IT Automation
- Application Management

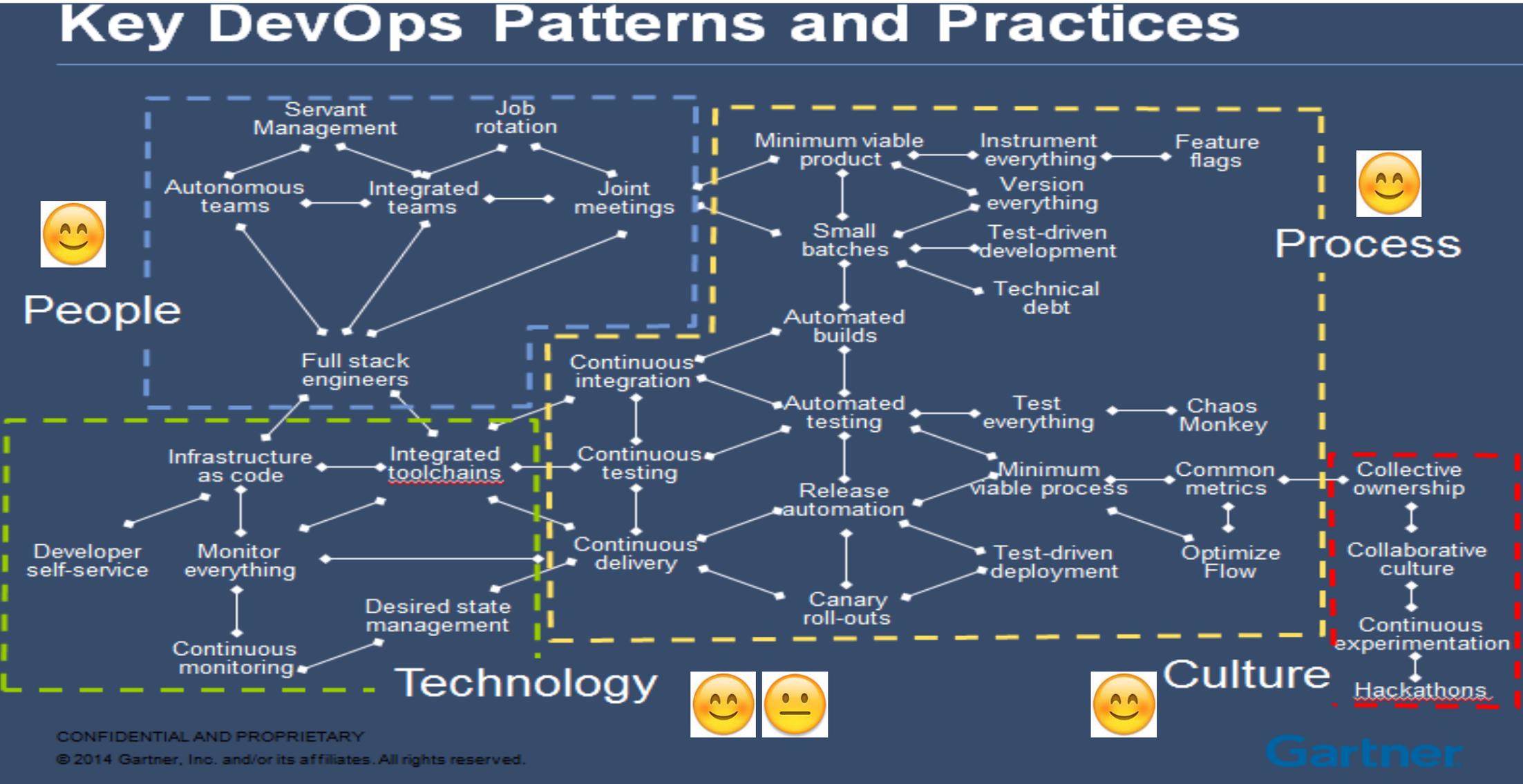
IT Agility



IT Operations



# DevOps Patterns and Best Practice



# Legend



**Yes!**



**Maybe**

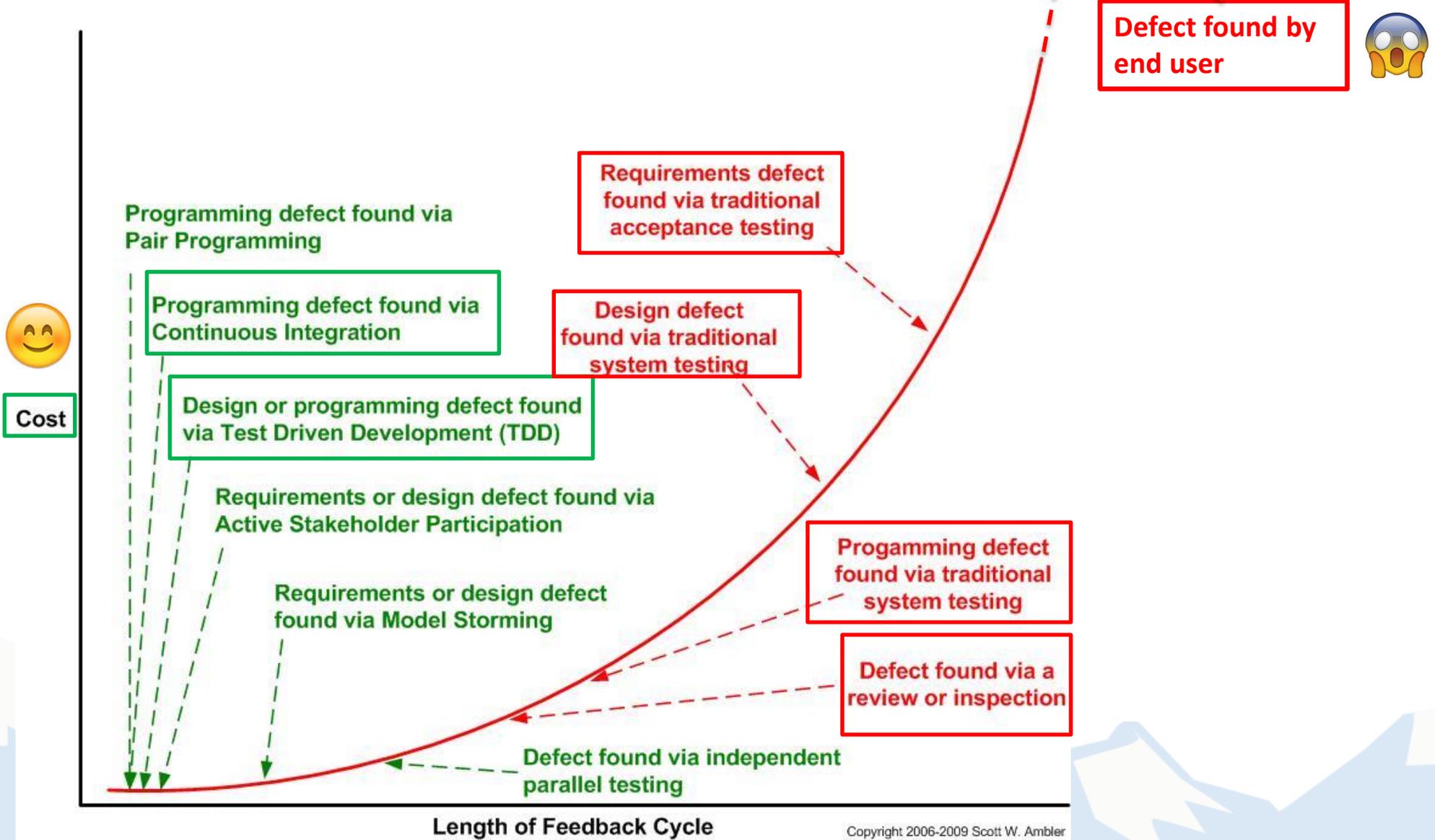


**No**



**OMG No!**

# DevOps Defect Resolution

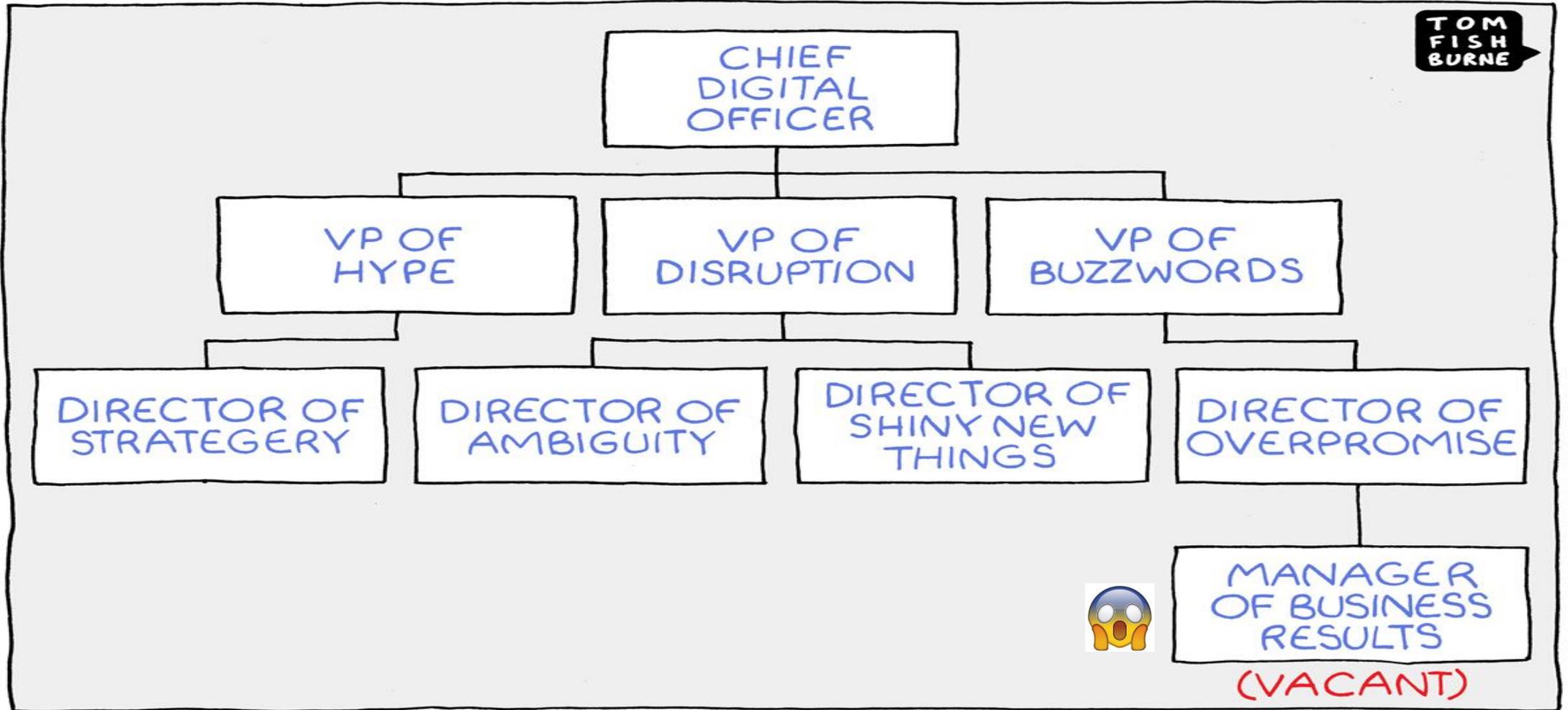


Copyright 2006-2009 Scott W. Ambler



# Business Challenges on IBM i IT - DT

TOM  
FISH  
BURNE



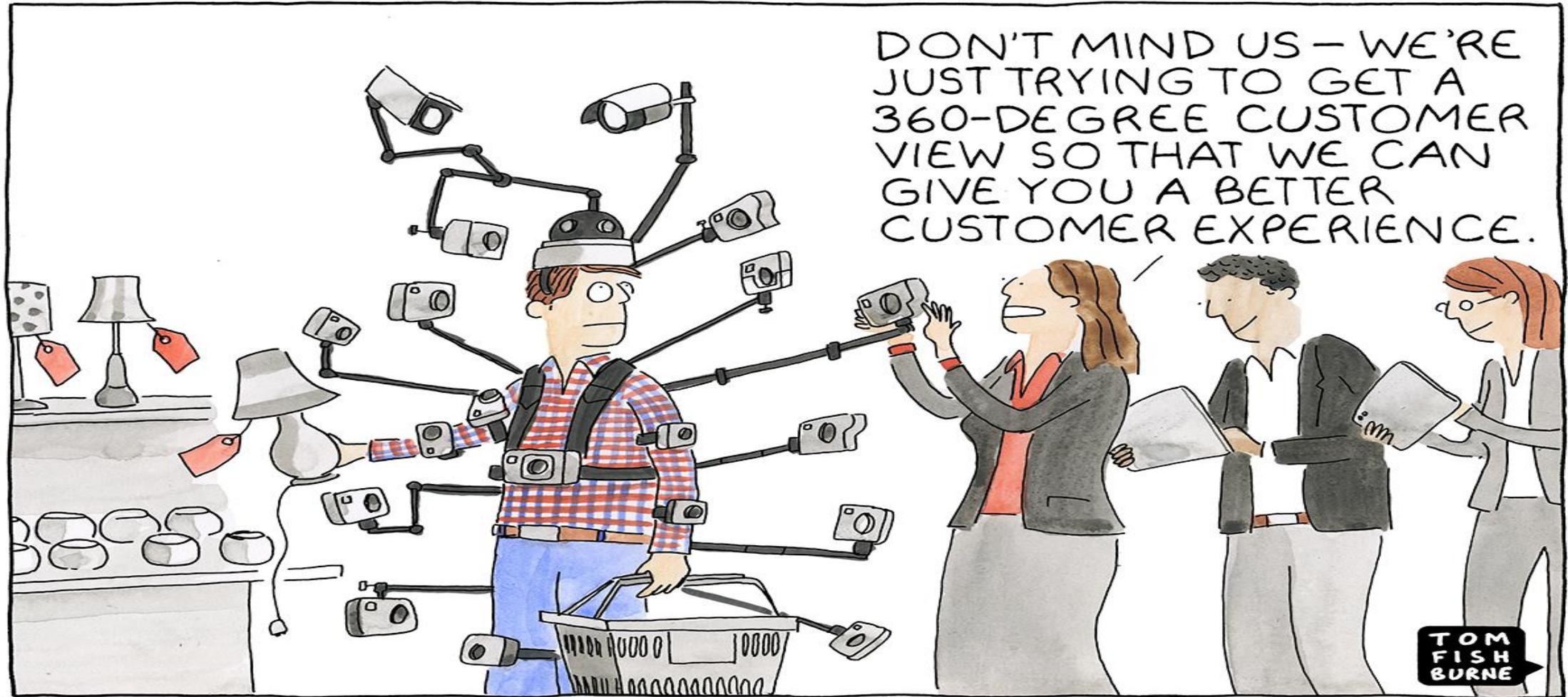
© marketoonist.com

# Challenges on IBM i - DT



© marketoonist.com

# Challenges on IBM i - DT



© marketoonist.com

# Challenges on IBM i - DT

## THE SIX STAGES OF DIGITAL TRANSFORMATION



### **BUSINESS AS USUAL:**

Organizations operate with a familiar legacy perspective of customers, processes, metrics, business models, and technology, believing that it remains the solution to digital relevance.



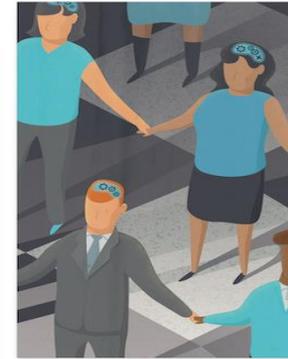
### **PRESENT AND ACTIVE:**

Pockets of experimentation are driving digital literacy and creativity, albeit disparately, throughout the organization while aiming to improve and amplify specific touch-points and processes.



### **FORMALIZED:**

Experimentation becomes intentional while executing at more promising and capable levels. Initiatives become bolder and, as a result, change agents seek executive support for new resources and technology.



### **STRATEGIC:**

Individual groups recognize the strength in collaboration as their research, work, and shared insights contribute to new strategic roadmaps that plan for digital transformation ownership, efforts, and investments.



### **CONVERGED:**

A dedicated digital transformation team forms to guide strategy and operations based on business and customer-centric goals. The new infrastructure of the organization takes shape as roles, expertise, models, processes, and systems to support transformation are solidified.



### **INNOVATIVE AND ADAPTIVE:**

Digital transformation becomes a way of business as executives and strategists recognize that change is constant. A new ecosystem is established to identify and act upon technology and market trends in pilot and, eventually, at scale.

ALTIMETER  
@Prophet

# Do not under estimate the impact and value of DevOps

## About DevOps Research and Assessment



DevOps Research and Assessment (DORA), founded by Dr. Nicole Forsgren, Jez Humble, and Gene Kim, conducts research into understanding high performance in the context of software development and the factors that predict it. DORA's research over four years and more than 30,000 data points serves as the basis for a set of evidence-based tools for evaluating and benchmarking technology organizations and identifying the key capabilities to accelerate their technology transformation journey.

Learn more at [devops-research.com](https://devops-research.com).

# DORA State of DevOps 2018

COMPARING THE ELITE GROUP AGAINST THE LOW PERFORMERS, WE FIND THAT **ELITE PERFORMERS HAVE...**



**46 TIMES MORE**  
frequent code deployments



**2,555 TIMES FASTER**  
lead time from commit to deploy

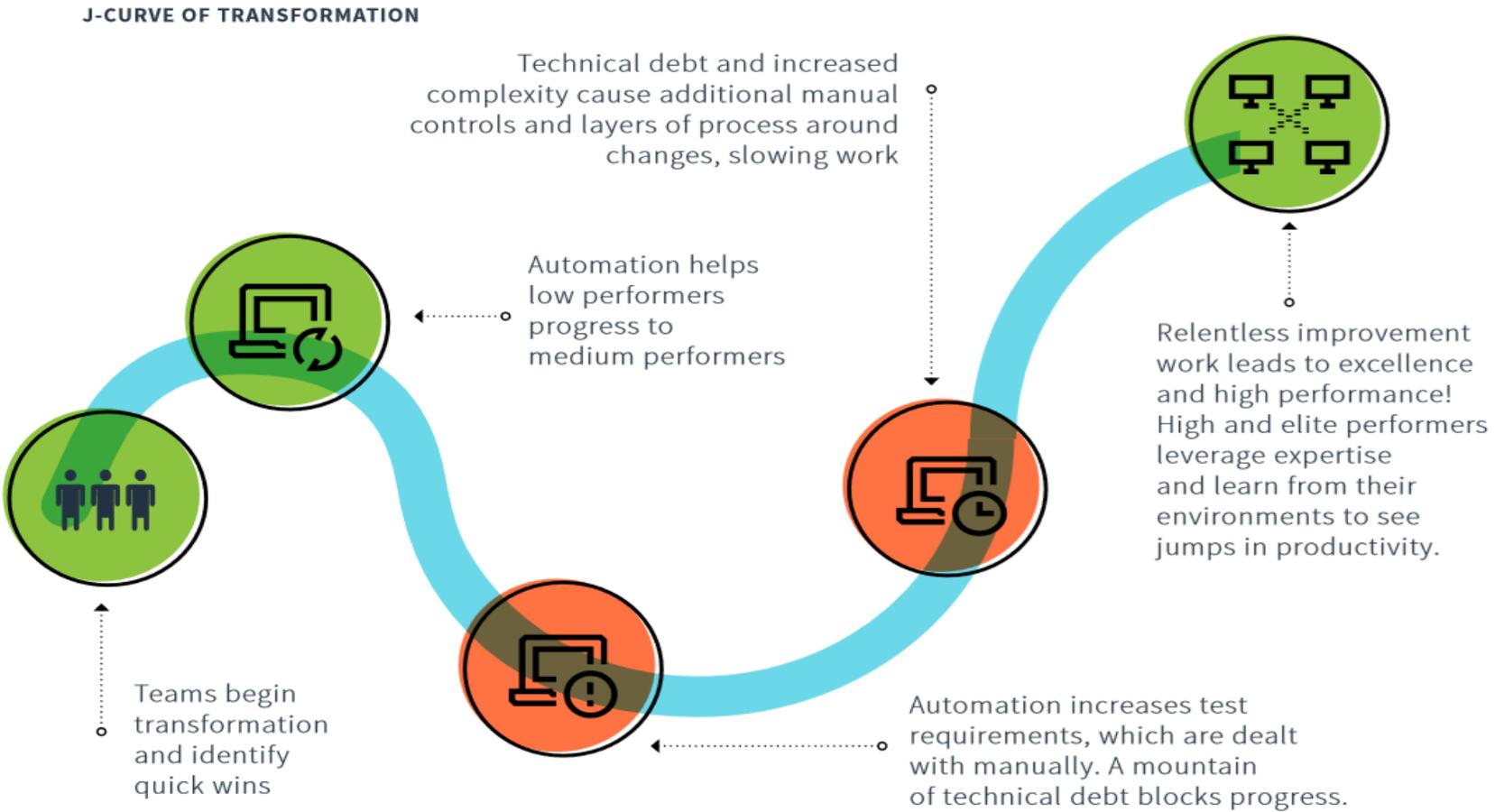


**7 TIMES LOWER**  
change failure rate  
(changes are 1/7 as likely to fail)



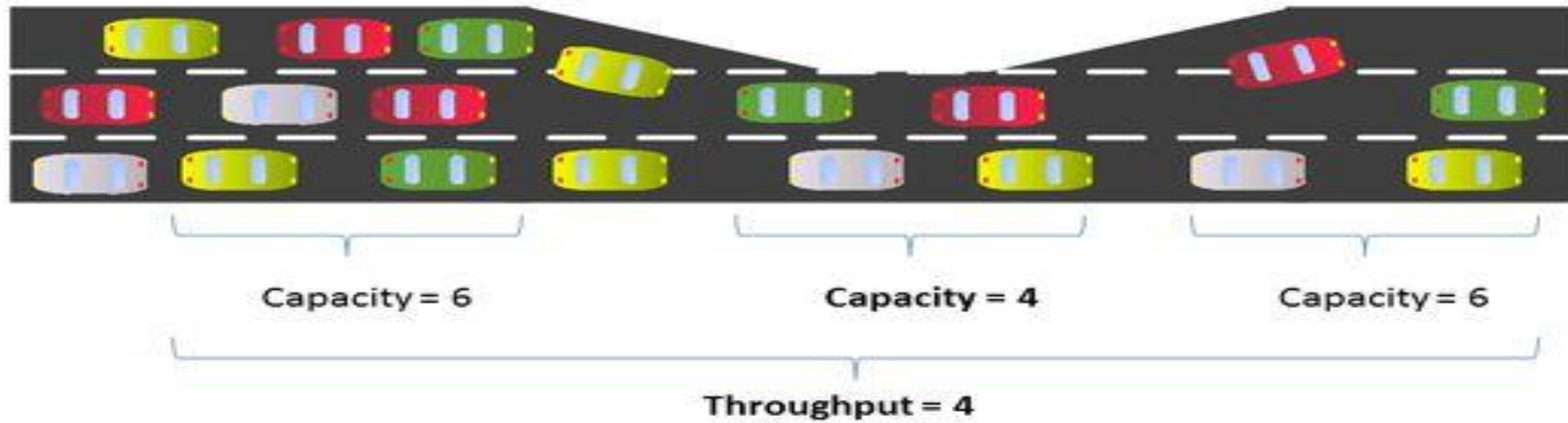
**2,604 TIMES FASTER**  
time to recover from incidents

# DevOps Not a Perfect Science



# Challenges on IBM i – Agile vs DevOps

You can't go faster than your bottleneck



Created by Håkan Forss @hakanforss <http://hakanforss.wordpress.com>





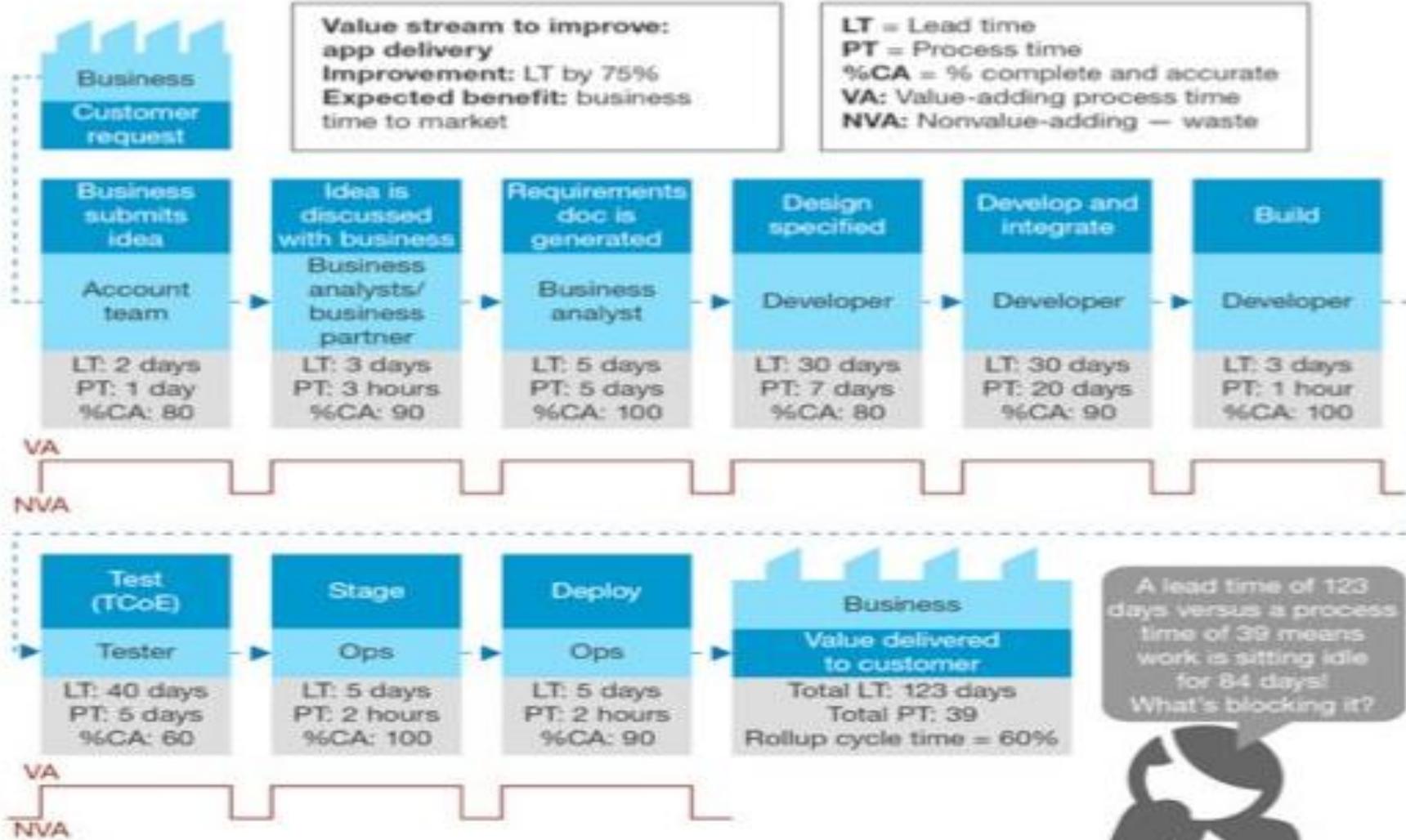
# DevOps People, Process and Tools

Becoming Agile...

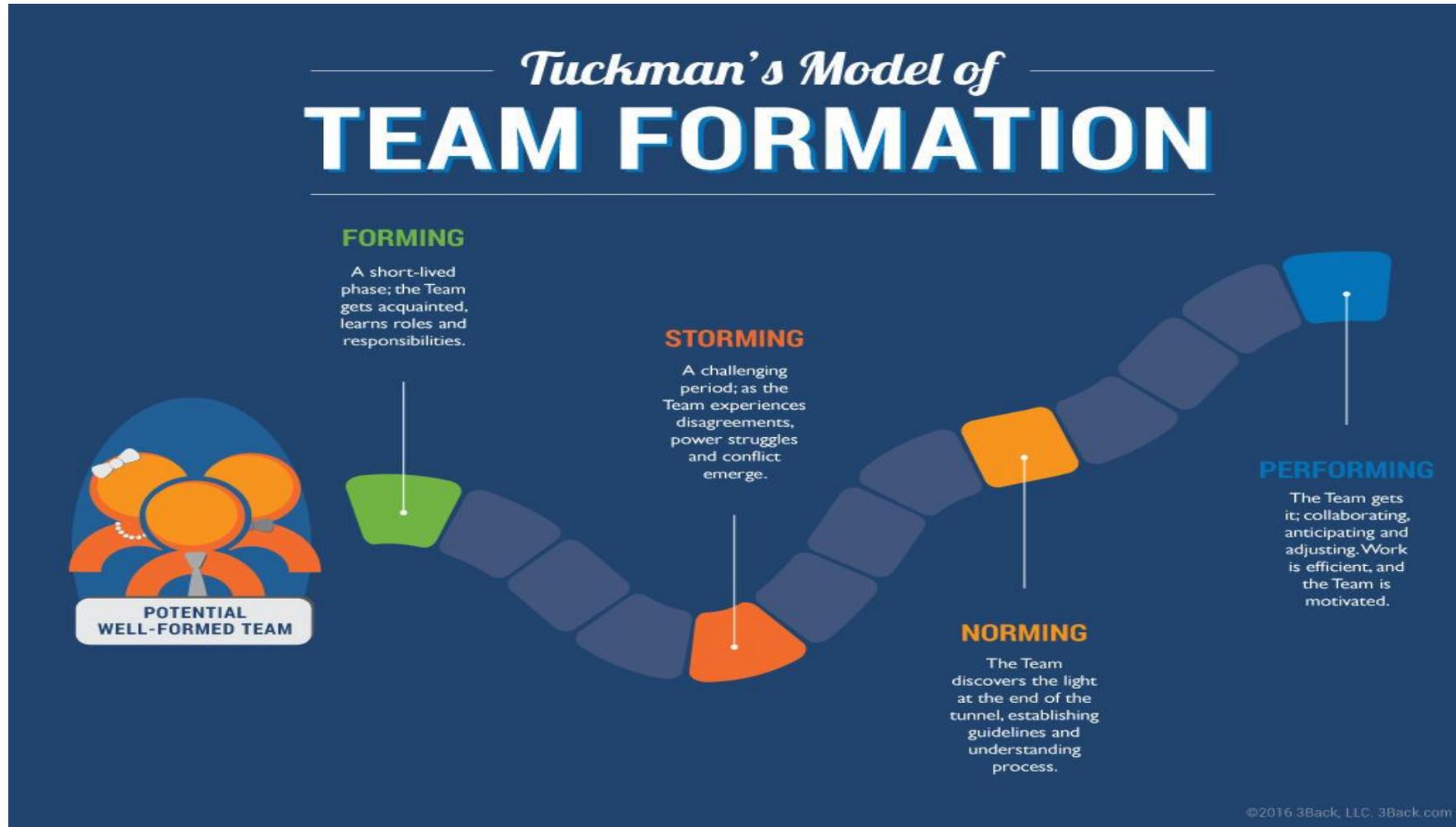
# DevOps – Value Stream Mapping

Use Value Stream Mapping to Uncover Waste in your pipeline.

Prioritize process automation using Value Stream Management.



# Starting Lineup



# Build a tower-Build a team

**The Challenge**



**Eighteen Minutes**  
**Teams of Four**  
**Tallest Freestanding Structure**



20 sticks of spaghetti + one yard tape + one yard string + one marshmallow

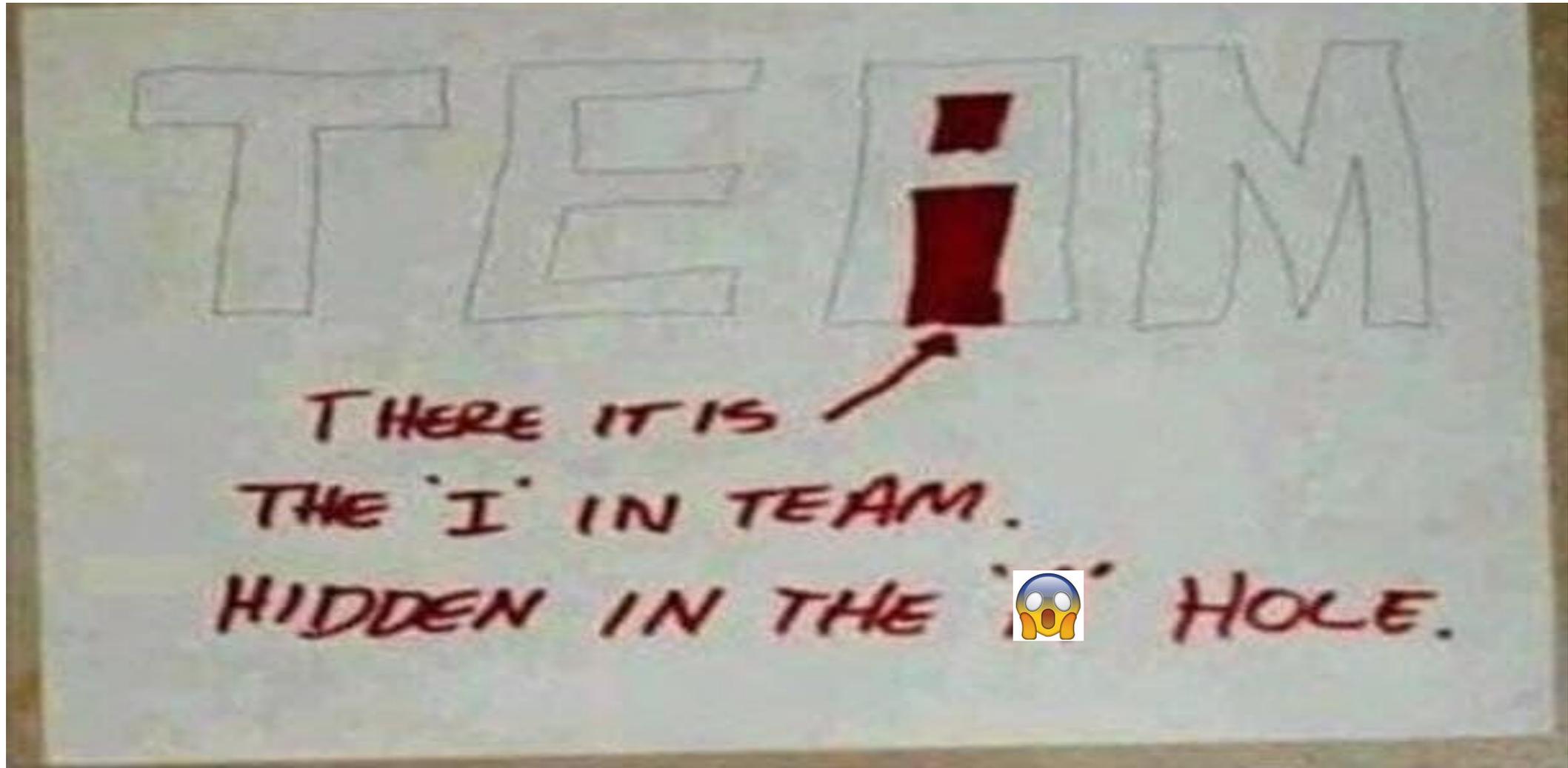


# IBM i Transformational Change



© marketoonist.com

# TP AS/400 Slide - There is an "i" in team





# DevOps Tools of Ignorance

Becoming Agile...

# The DevOps promise...



**ACCELERATE**  
software  
delivery



**BALANCE**  
speed, cost,  
quality  
and risk



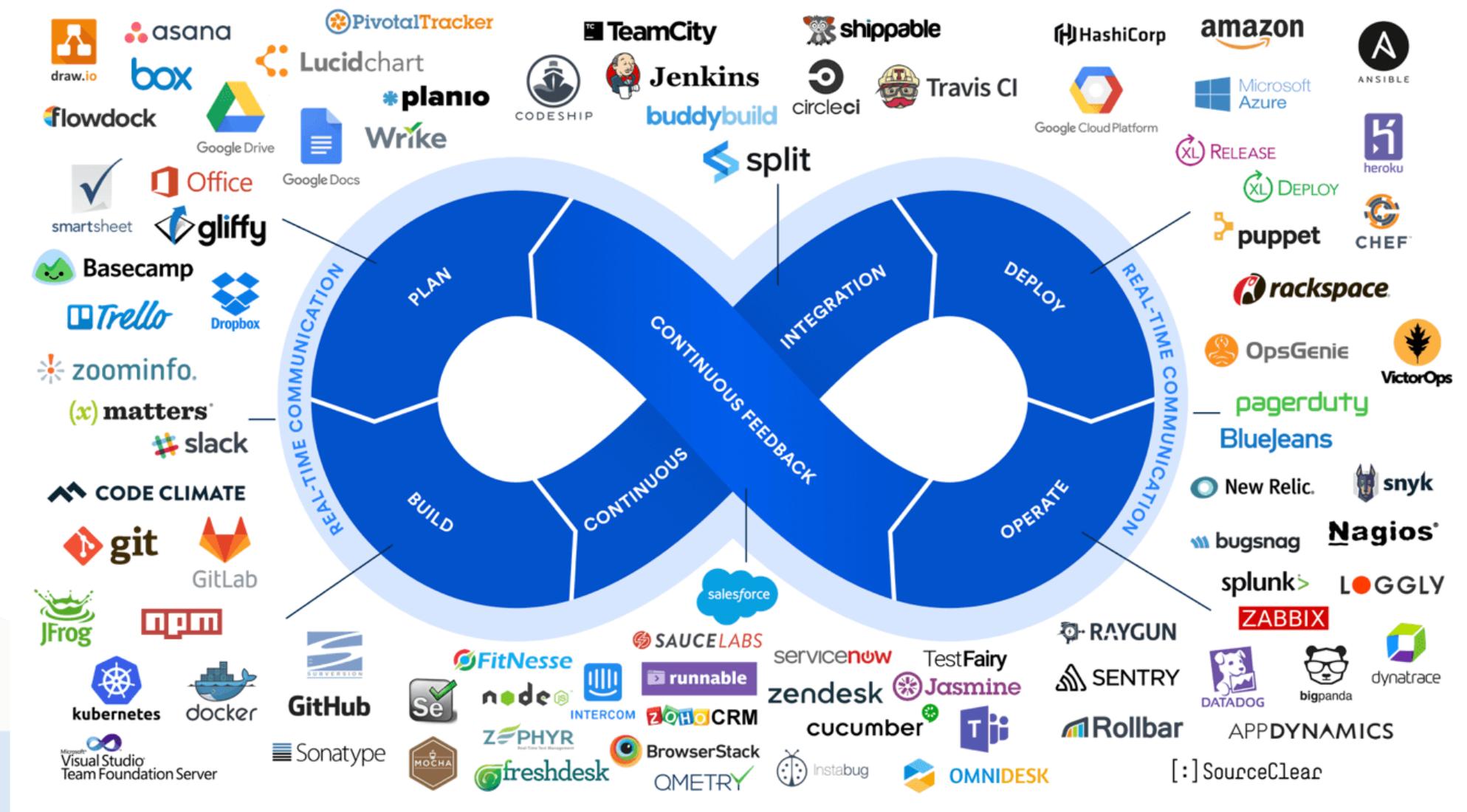
**REDUCE**  
time  
to customer  
feedback

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DevOps means people, process, and the right tools working together to make the delivery lifecycle faster and more predictable.

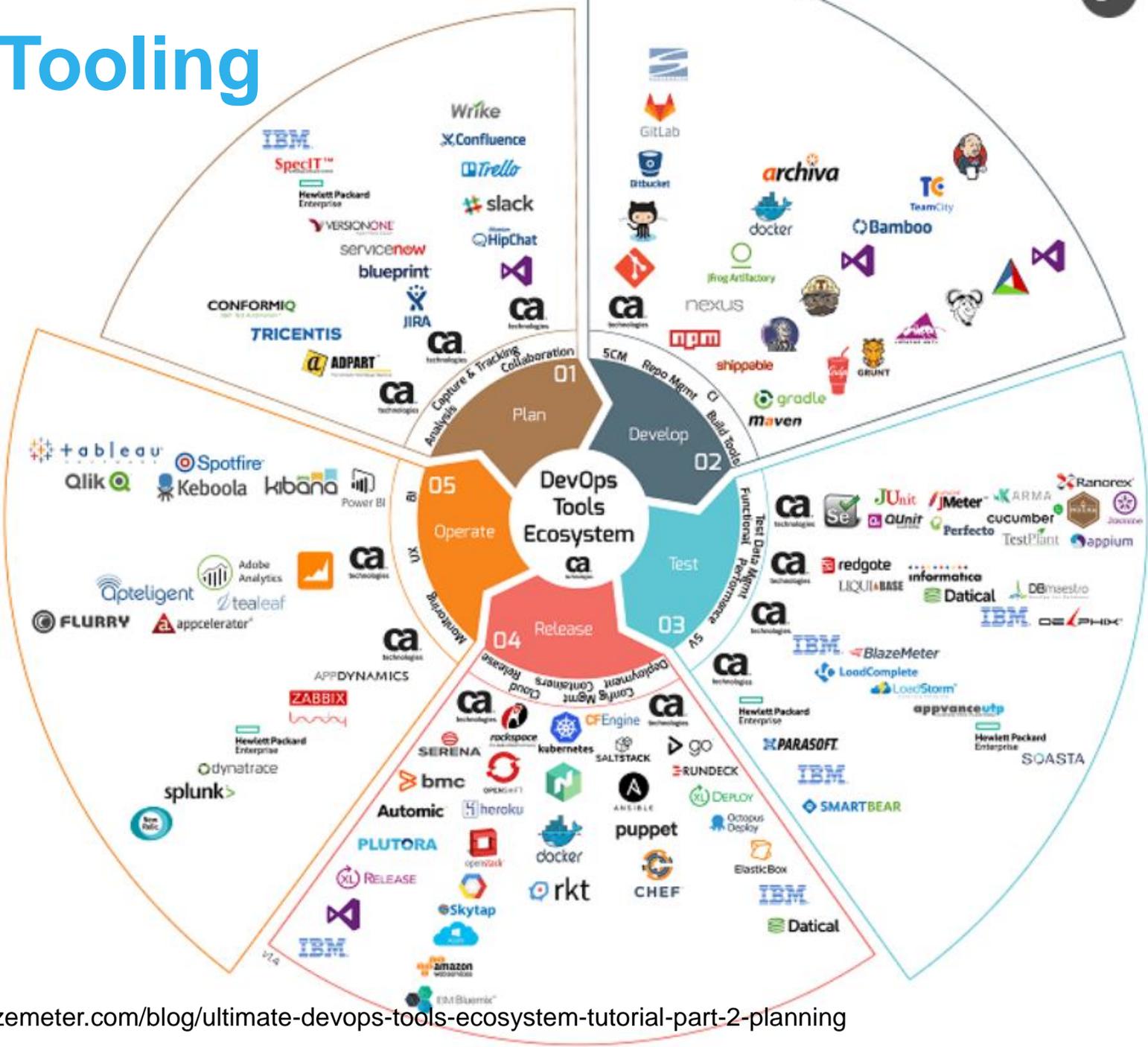


# DevOps Tooling



<https://www.enterpriseirregulars.com/116202/race-pipeline-atlassian-aint-playin-introducing-devops-marketplace>

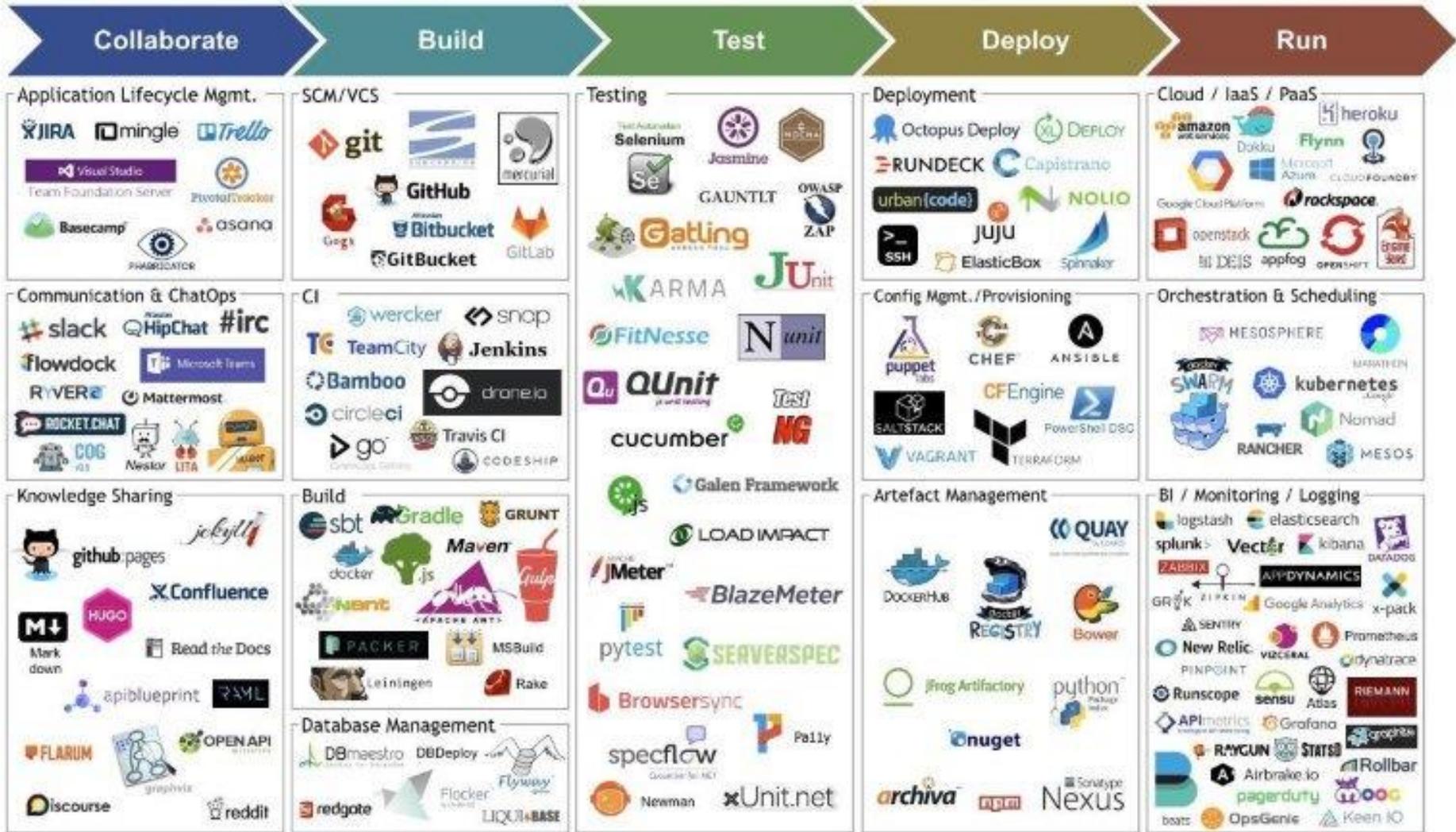
# DevOps Tooling



<https://www.blazemeter.com/blog/ultimate-devops-tools-ecosystem-tutorial-part-2-planning>



# DevOps Tooling



# DevOps Tooling

## DevOps Enabler Tools v2 (Caution!!!! : Consider only after DevOps mindset is established)

Infra-as-code



ANSIBLE



puppet



CHEF™



SALTSTACK

CI/CD



Jenkins



shippable

Bamboo



TeamCity

Test Automation



Cucumber



appium



APACHE  
JMeter™

Container



docker

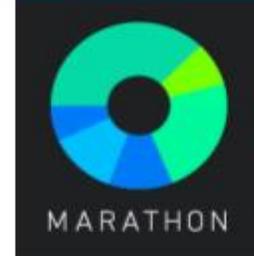


Rocket



unik

Orchestration



Deployment



Measurement



elasticsearch.

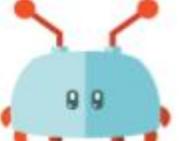


Kibana

sumologic



ChatOps

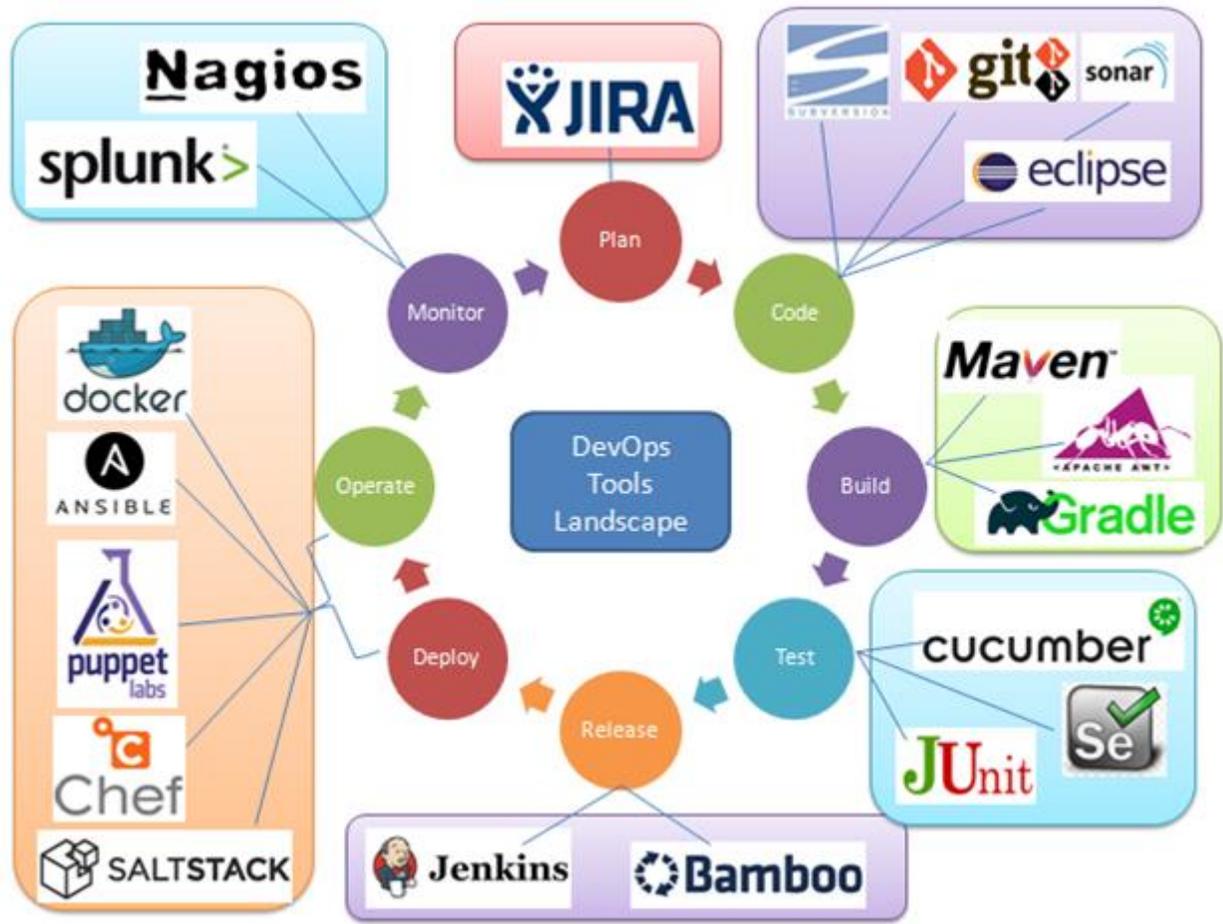


LITA

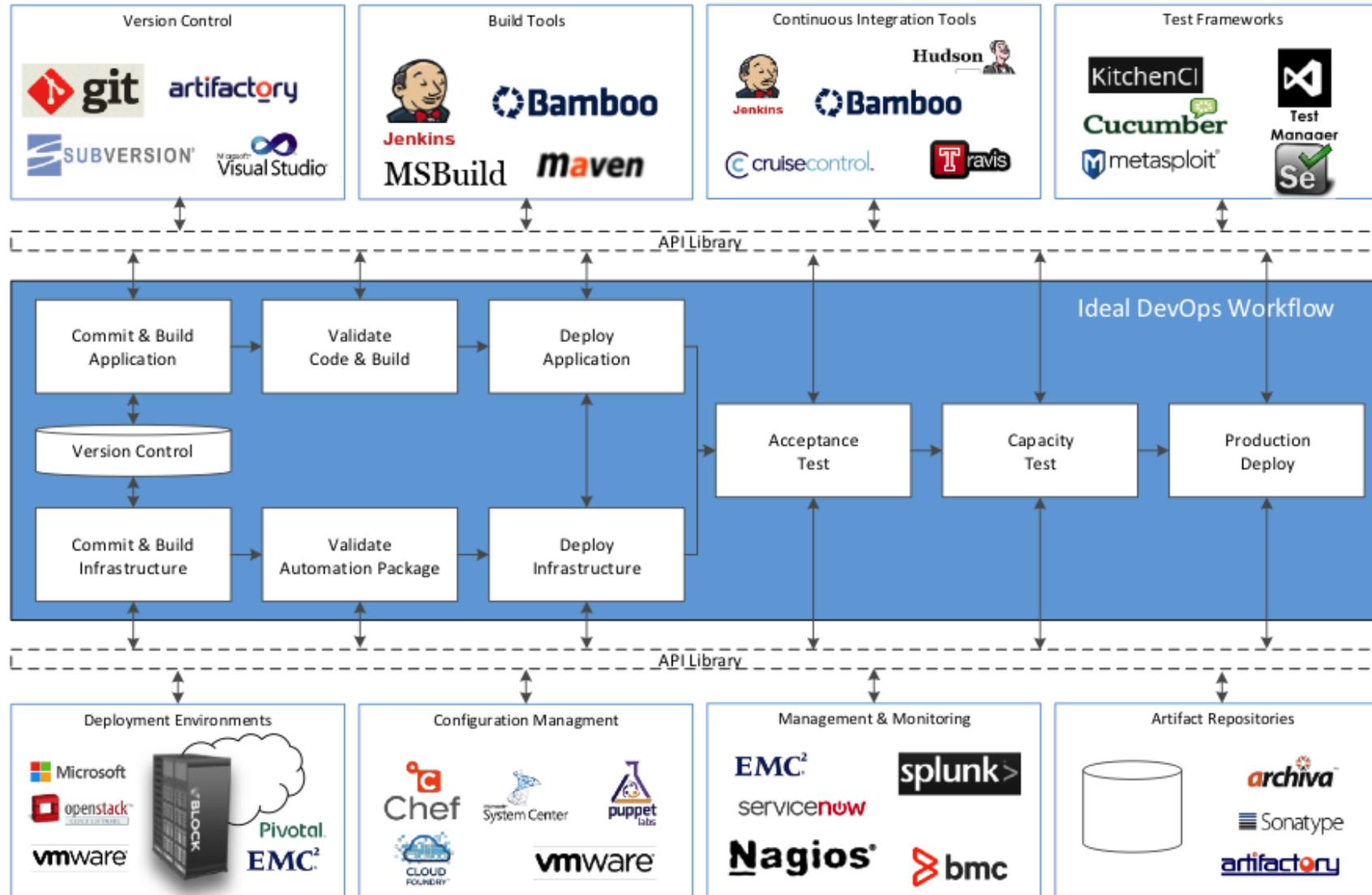


kloia

# DevOps Tooling

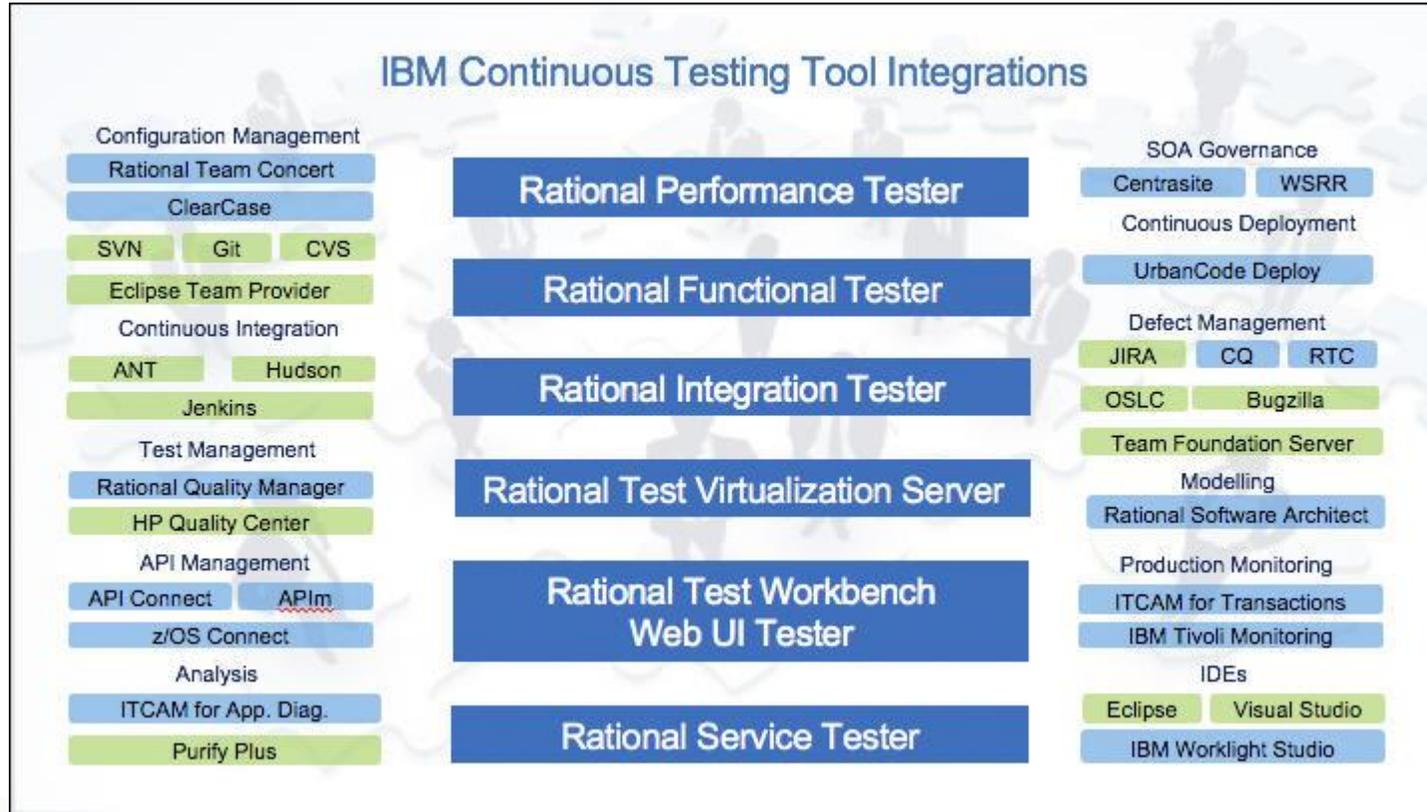


# DevOps Tooling

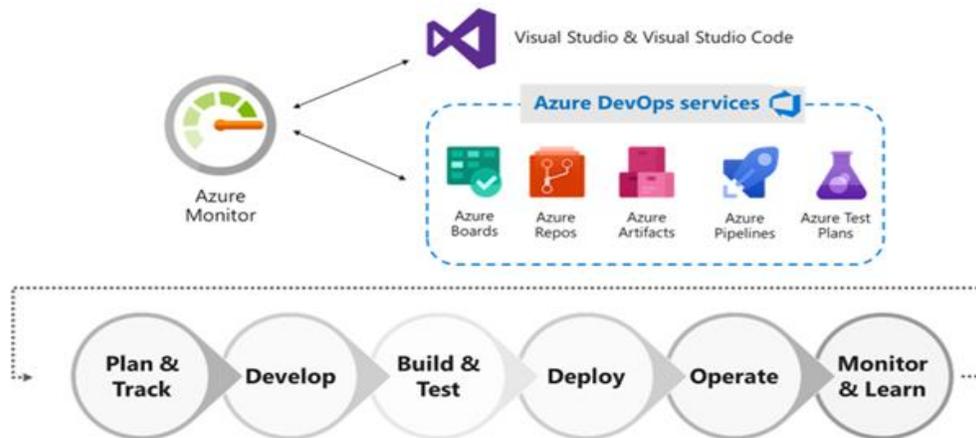
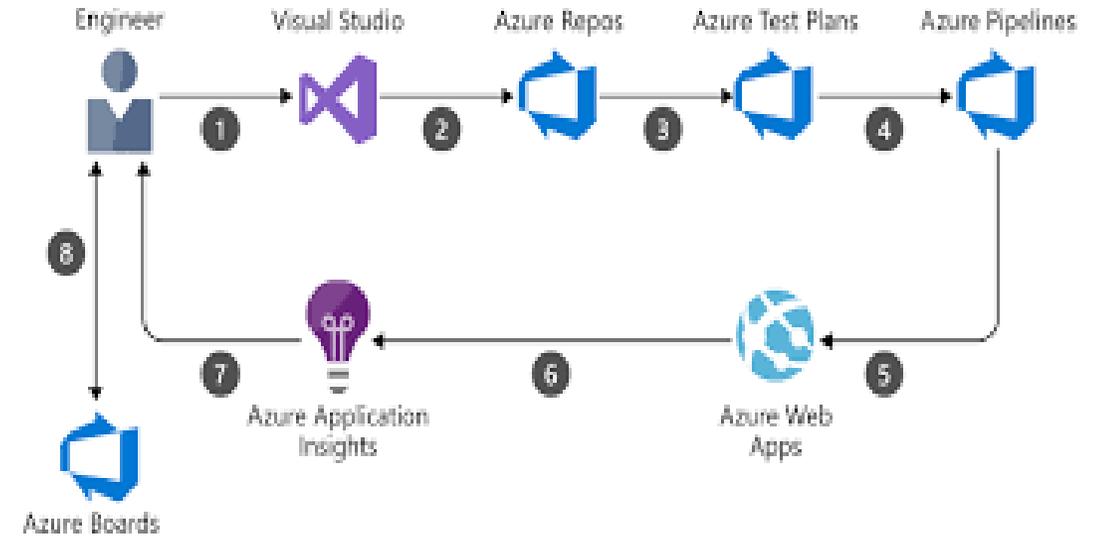
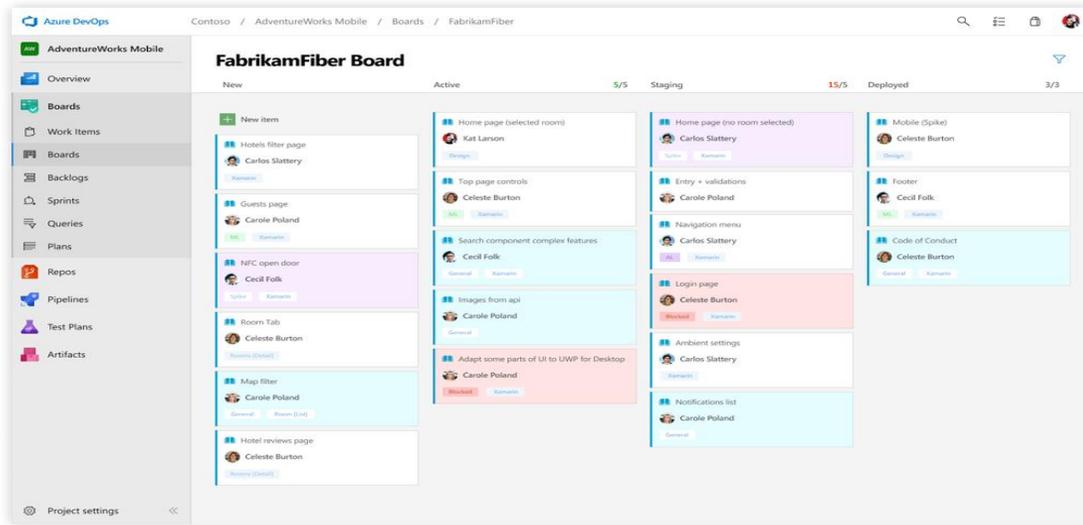


- [https://infocus.dellemc.com/bart\\_driscoll/common-devops-tool-chains-pitfalls](https://infocus.dellemc.com/bart_driscoll/common-devops-tool-chains-pitfalls)

# IBM DevOps Tooling



# What about Azure DevOps?



# DevOps

- DevOps is not tooling
  - DevOps is a changed mind set
    - *How can I quickly, and safely, deliver features to end-users*
  - Developers, end-users and testers are in constant communication
  - Versions are archaic
    - *Feature releases*
  - DevOps require Application Modernization Modularization
    - Object Oriented
    - MVC
    - Scriptable test cases
  - ...but, tools do (often) make things easier...

# DevOps

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    - MVC
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# Questions

What did you think?