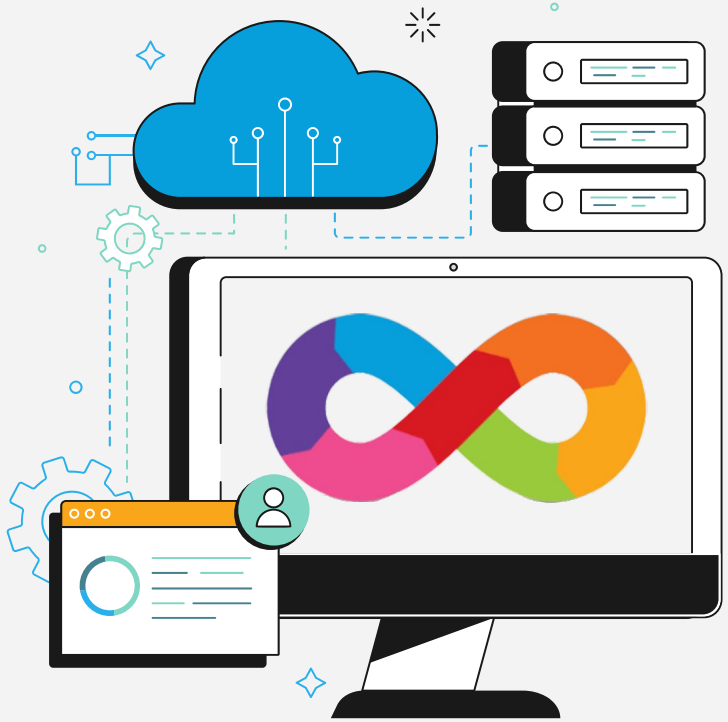
Introduction to DevOps

@ IBA - SMCS

Week 01



Obaid ur Rehman
Software Architect / Engineering Manager @ Folio3

About Your instructor 👨‍🏫

- Software Architect / Cloud Architect, Engineering Manager at **Folio3**
- BS(CS) University of Karachi **2006**, MS(SPM) FAST-NUECS **2010**
- Certified AWS Solutions Architect.
- Over 17+ years of professional experience.
- Architected & Delivered numerous highly scalable, enterprise level applications in industries ranging from Wall street trading systems, e-commerce to consumer applications.
- Part of Leadership team at the Folio3 Cloud Practice.

Course Outline and related stuff

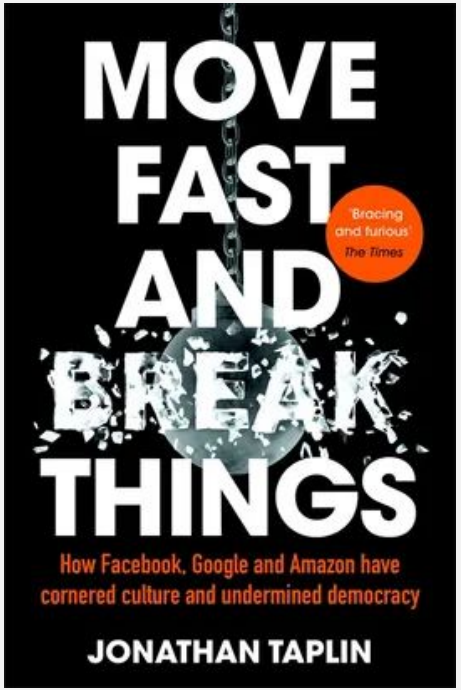
Arriving next class ✈️

Course Overview - Tentative

1. Introduction to DevOps
2. Continuous Integration and Delivery (CI/CD)
3. Deployment Strategies
4. Containerization & Orchestration
5. Infrastructure as Code (IaaC)
6. DevOps in the realm of Cloud
7. Infrastructure and application Scalability
8. Monitoring and Observability
9. Disaster Recovery
10. Introduction to DevSecOps, MLOps SRE, and related paradigms
11. Case Studies and real world examples of Infra, DevOps etc.

Velocity of release is important

- In a fast moving economy, delivering features from development to production is really important.
- Velocity translates to Time to market.

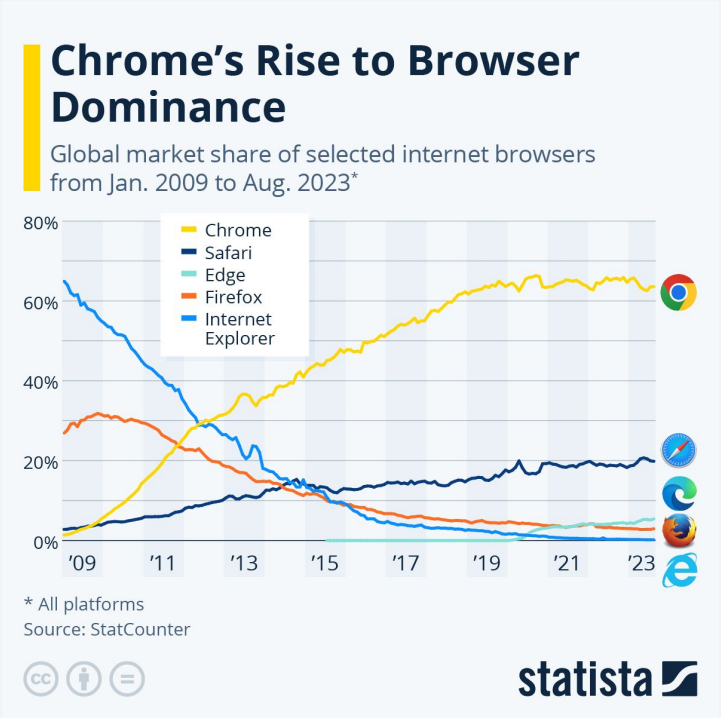


Velocity of release is important – Case Study

Background: Google entered the web browser market in 2008, competing against established browsers like Internet Explorer, Firefox, and Safari.

Google adopted a rapid release cycle for Chrome, with frequent updates to improve speed, security, and features. The open-source Chromium project allowed for community collaboration and faster development.

Outcome: Chrome quickly gained market share, surpassing competitors due to its speed, simplicity, and regular updates.



Release statics

- Amazon releases to production **every 11.5 seconds** [May 2011] [1]
- Facebook **Releases 3 times a Day** [2017] [2]

1. https://youtu.be/dxk8b9rSKOo?t=626
2. https://engineering.fb.com/2017/08/31/web/rapid-release-at-massive-scale/

How to increase velocity?

Automate, have Processes in place.

What is DevOps?

Patrick Debois

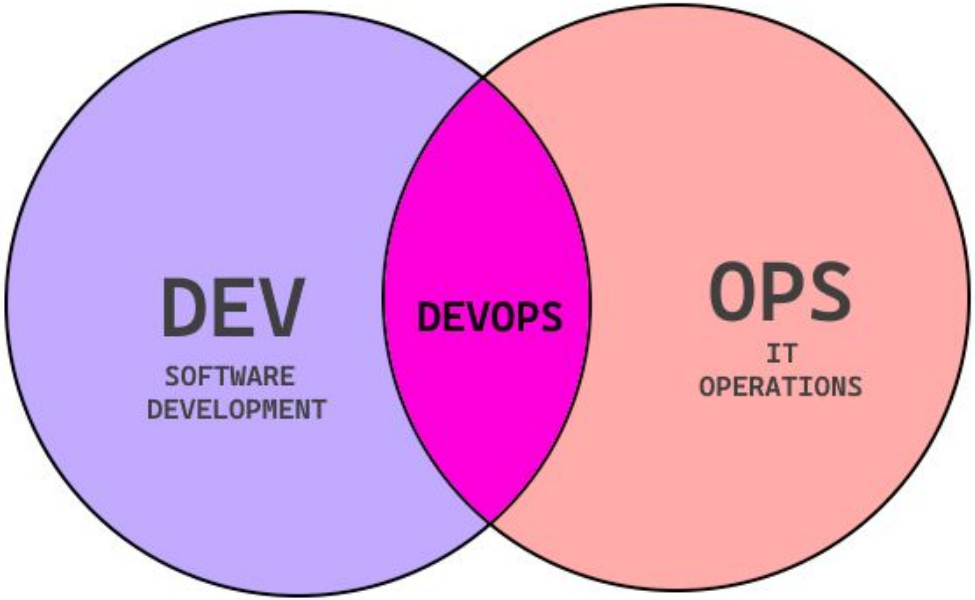
Andrew clay Shafer

What is DevOps?

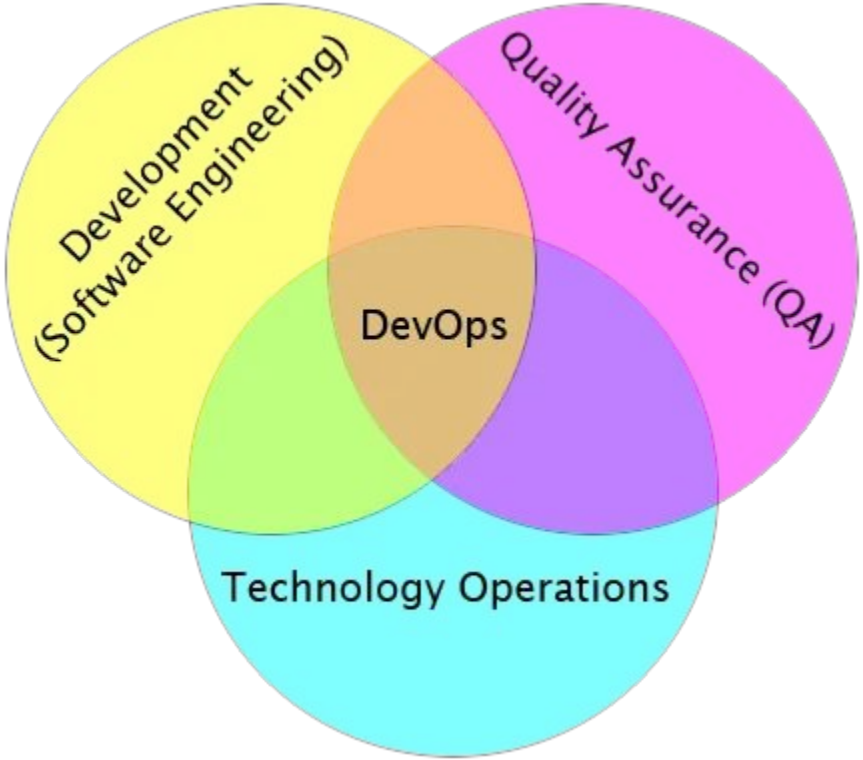
The term DevOps was introduced in 2007-2009 by Patrick Debois, Gene Kim, and John Willis, and it represents the combination of **Development (Dev)** and **Operations (Ops)**.

It has given rise to a **movement** that advocates bringing developers and operations together within teams. This is to be able to deliver added business value to users **more quickly** and hence be more competitive in the market.

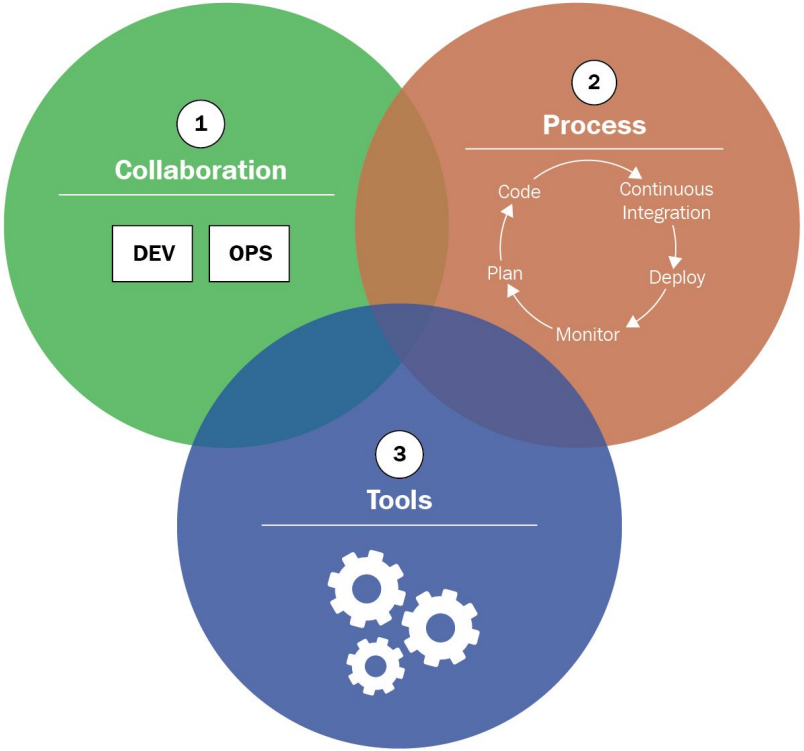
What is DevOps



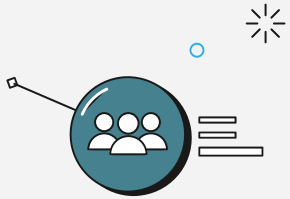
What is DevOps



The DevOps Culture

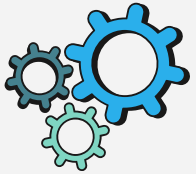


Collaboration



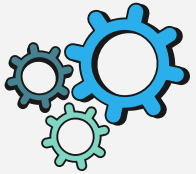
- This is the very essence of DevOps.
- Teams are no longer separated by silos specialization (one team of developers, one team of Ops, one team of testers, and so on), but, on the contrary, these people are brought together by making multidisciplinary teams that have the same objective: to **deliver** added value to the product as quickly as possible.

Processes



- To expect rapid deployment, these teams must follow development processes from agile methodologies with iterative phases that allow for better functionality quality and rapid feedback.
- These processes should not only be integrated into the development workflow with continuous integration but also into the deployment workflow with continuous delivery and deployment.

Processes



- Development
- Continuous integration and delivery
- Continuous deployment
- Continuous monitoring

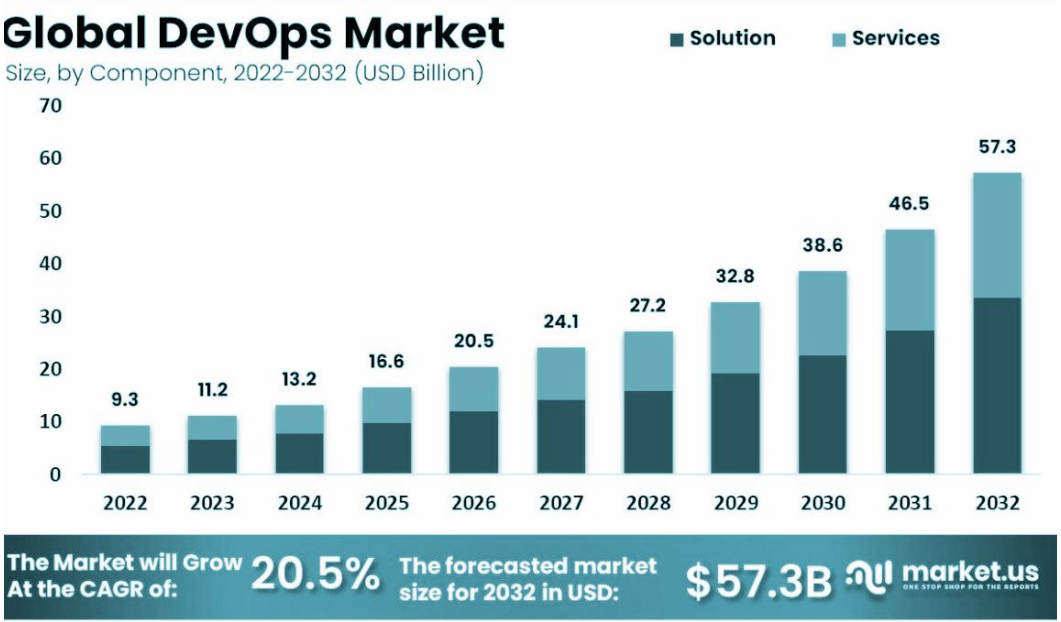
Tools

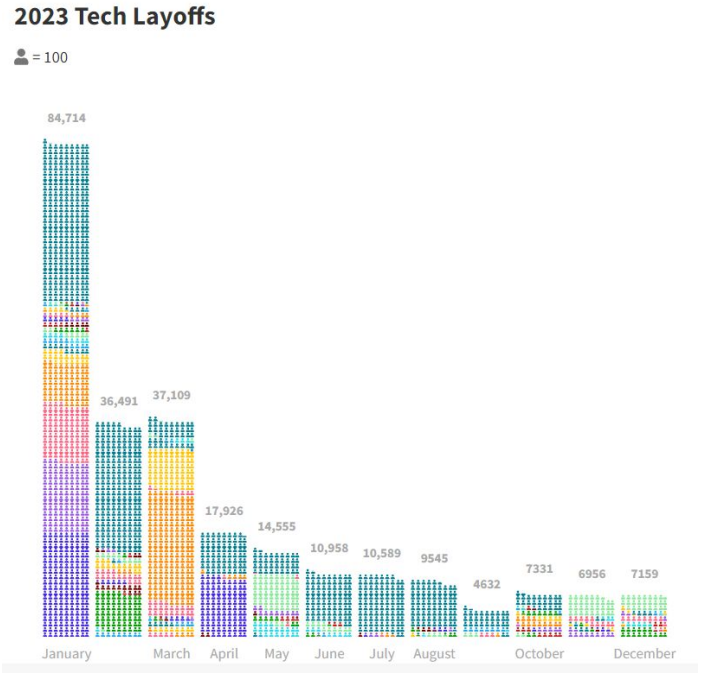
- The choice of tools and products used by teams is very important in DevOps.

- When teams were separated into Dev and Ops, each team used their specific tools—deployment tools for developers and infrastructure tools for Ops—which further widened communication gaps.

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

Current State of DevOps / Industry

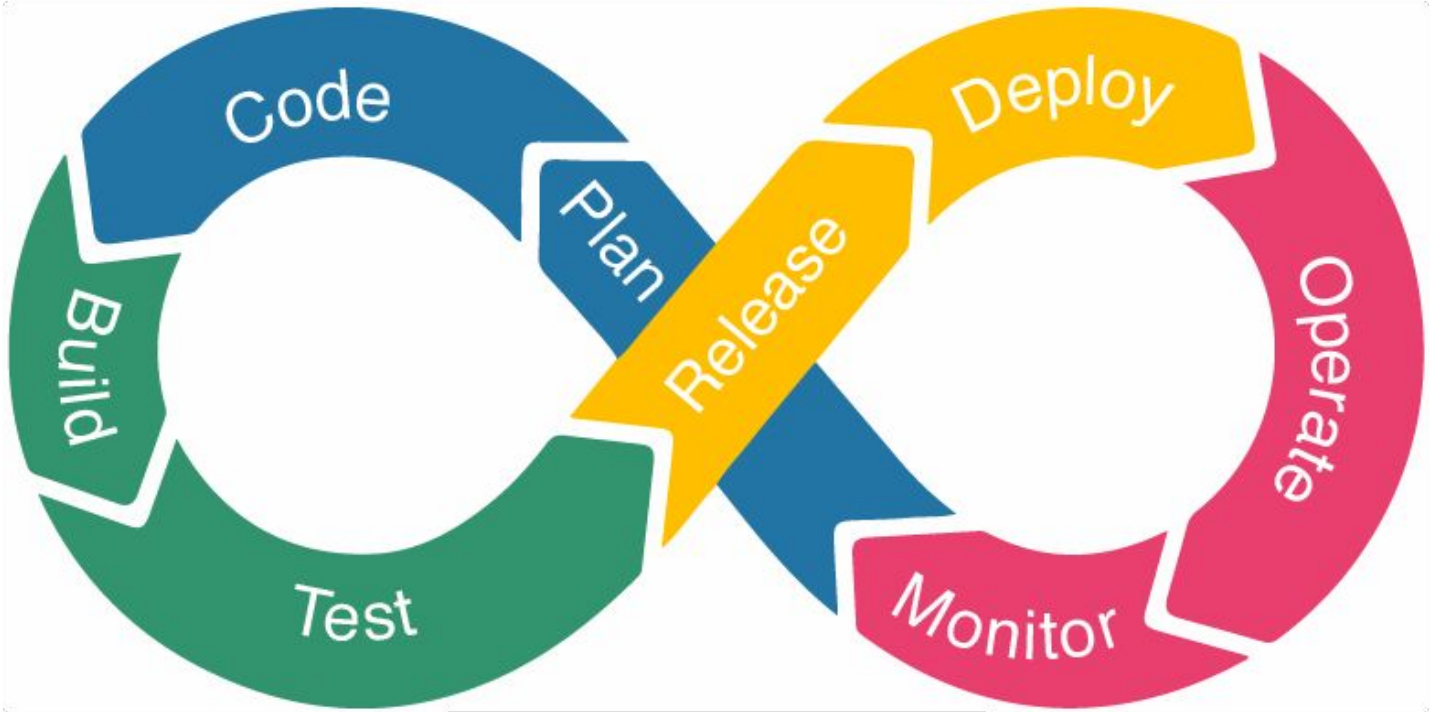




https://techcrunch.com/2024/01/18/tech-layoffs-2023-list/
https://layoffs.fyi/

Technology Trends in DevOps

The DevOps LifeCycle



DevOps Process

Release

Approve for deployment

Test

Ensure high test coverage & automate tests as much as possible

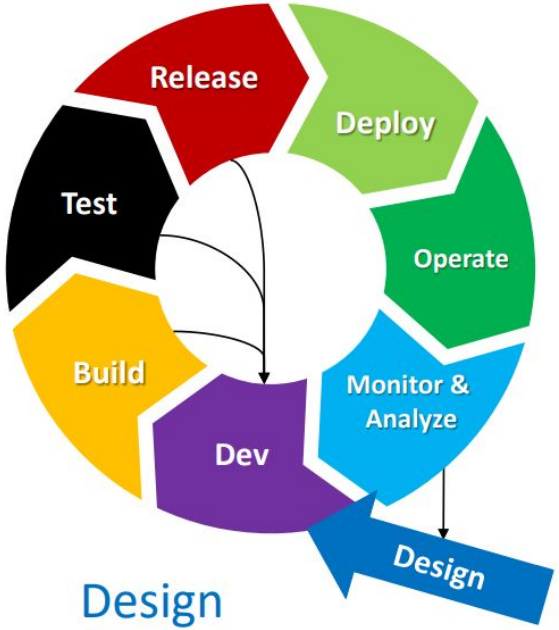
Build

Create an executable artifact

Dev

Perform normal development activities

Create scripts for other activities



Design

Design architecture to support other activities

Deploy

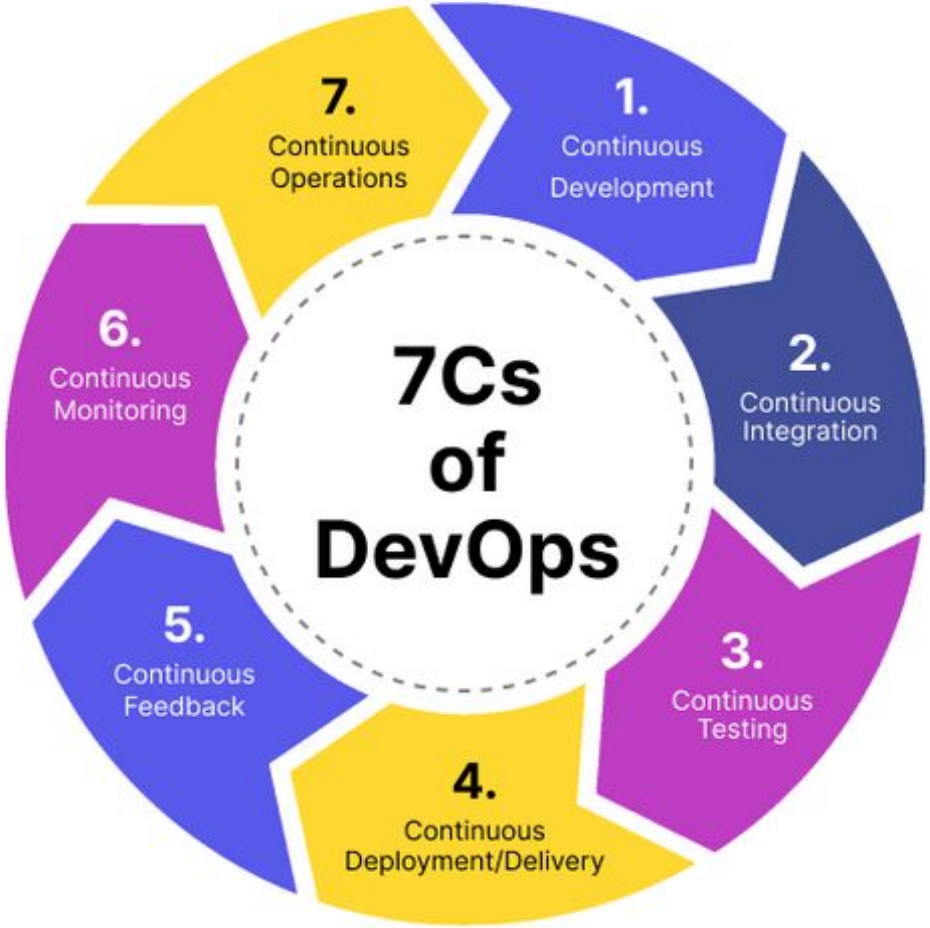
Move into production environment

Operate

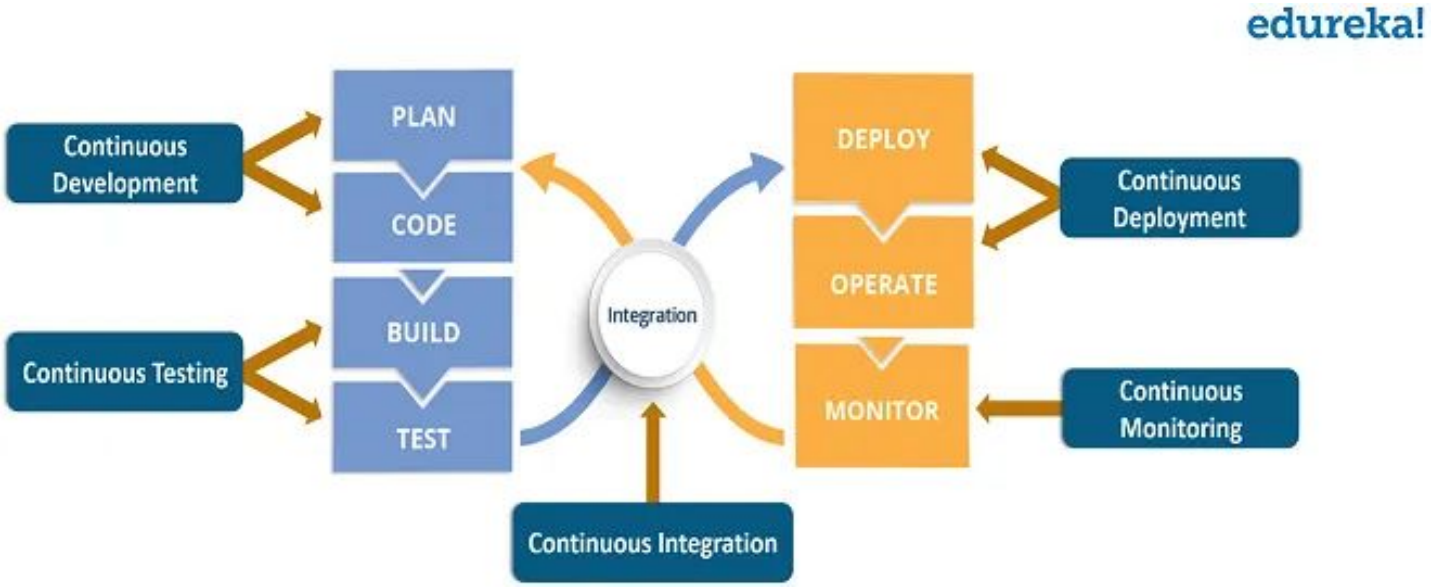
Execute system and gather measurements about its operation

Monitor & Analyze

Display measurements taken during operation
& analyze the data

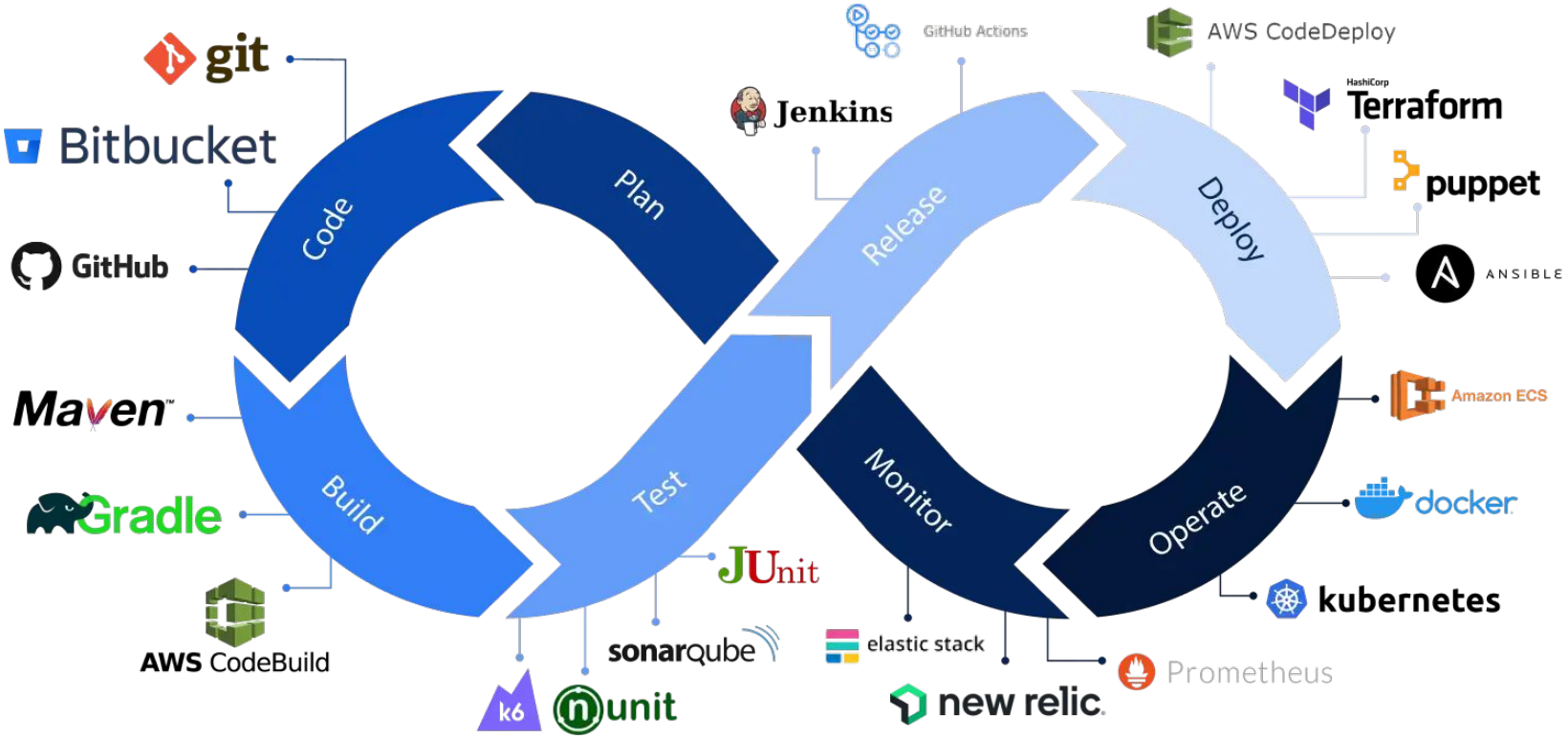

7Cs of DevOps
1. Continuous Development
2. Continuous Integration
3. Continuous Testing
4. Continuous Deployment/Delivery
5. Continuous Feedback
6. Continuous Monitoring
7. Continuous Operations

Map 7Cs to the Cycle



Source: https://www.browserstack.com/guide/devops-lifecycle

The DevOps Toolchain



Benefits of DevOps

- Reduced Risks
- High Quality Software
- Faster Delivery
- Faster Time to market
- Scalability without Risks
- Reliable Infra
- Customer Satisfaction

End of Week 1

Q&A