לקורס ניהול פרויקטי תוכנה

SOFTWARE PROJECTS MANAGEMENT

2021

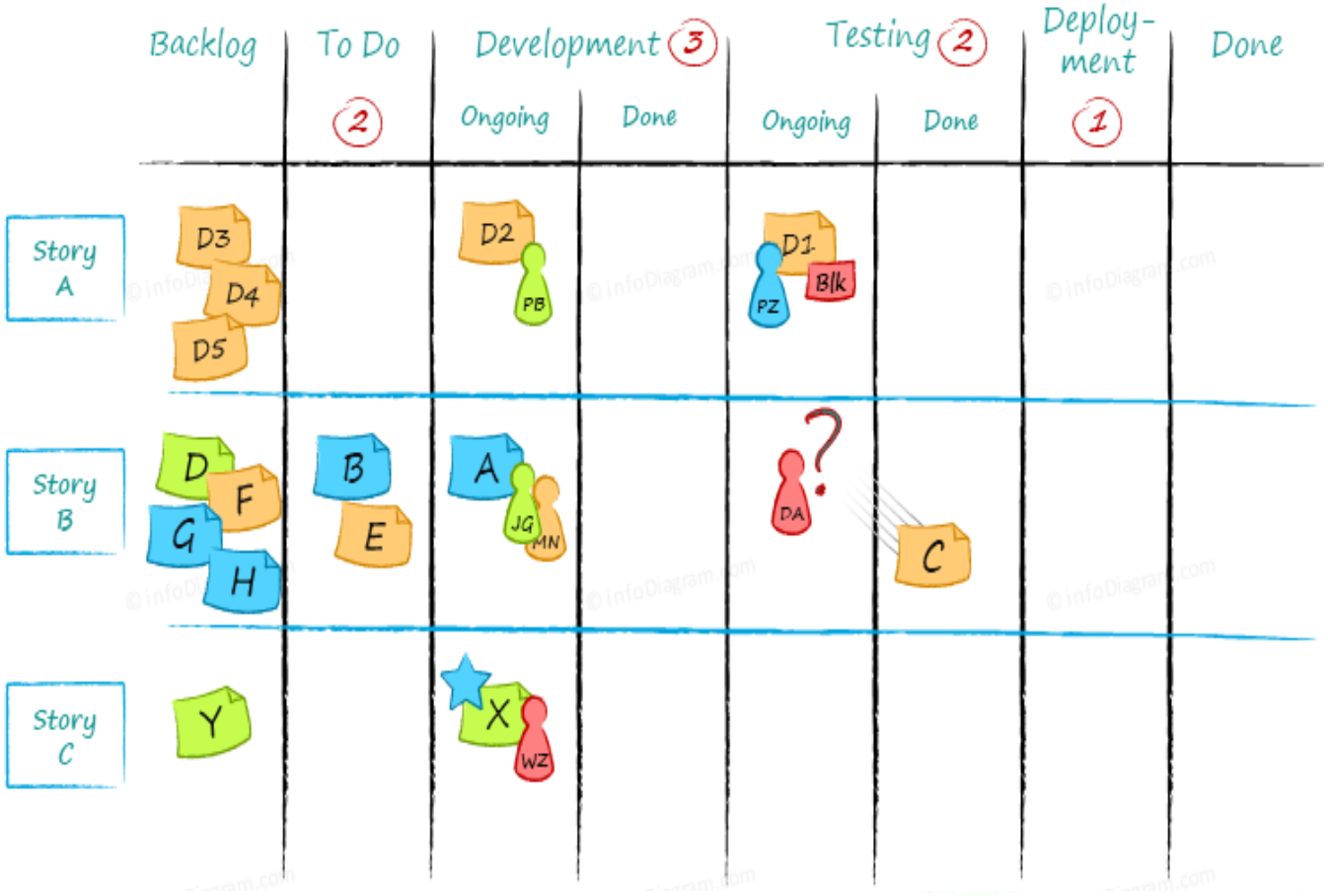
SCRUM (Lesson#3)

דר' הדס שוורץ-חסידים

sce
המכללה האקדמית להנדסה ע"ש סמי שמעון

Discussion - Development Methodologies

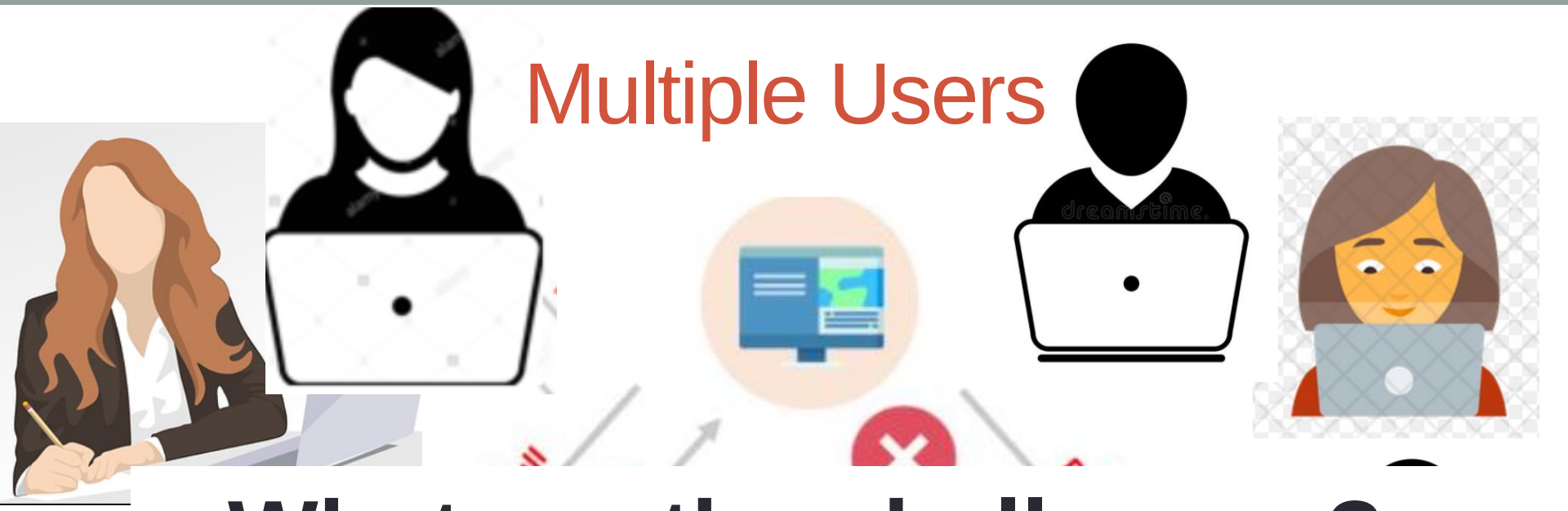
- Waterfall
- Prototyping (Spiral)
- Agile
- KanBan
- Scrum



Speeding Up

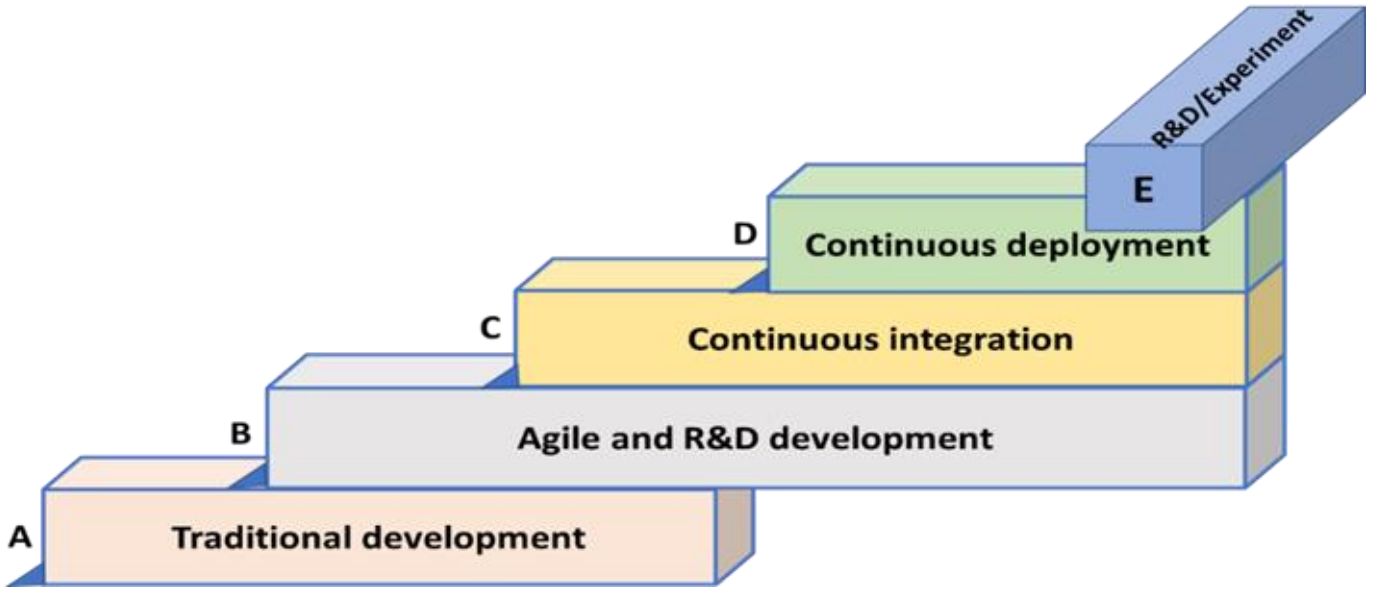
- Deliver to the customer fast
- Flexibility, efficiency and speed, agile practices
- Continuous improvement

Multiple Users



What are the challenges?

The “Stairs to Heaven”

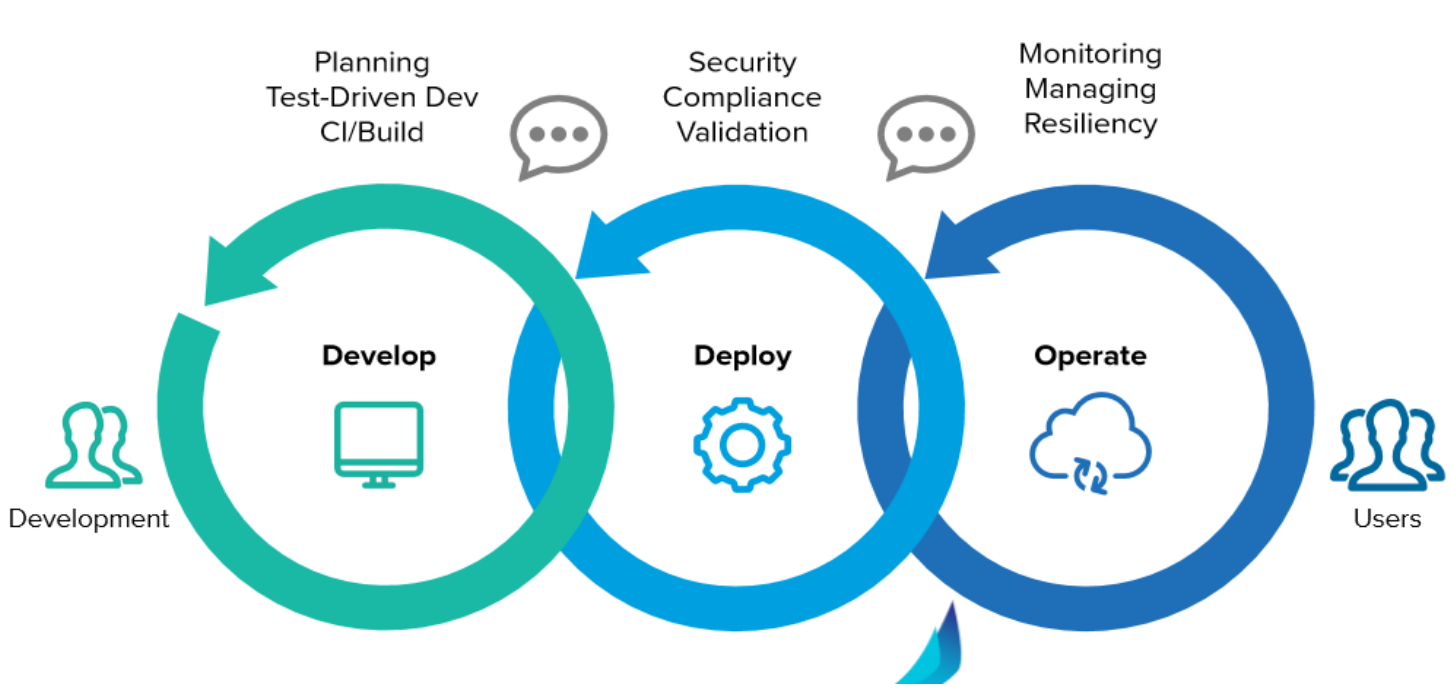


Olsson, H. H., Alahyari, H., & Bosch, J. (2012, September). Climbing the" Stairway to Heaven"--A Mulitiple-Case Study Exploring Barriers in the Transition from Agile Development towards Continuous Deployment of Software. In *2012 38th euromicro conference on software engineering and advanced applications* (pp. 392-399). IEEE.

DevOps CI CD

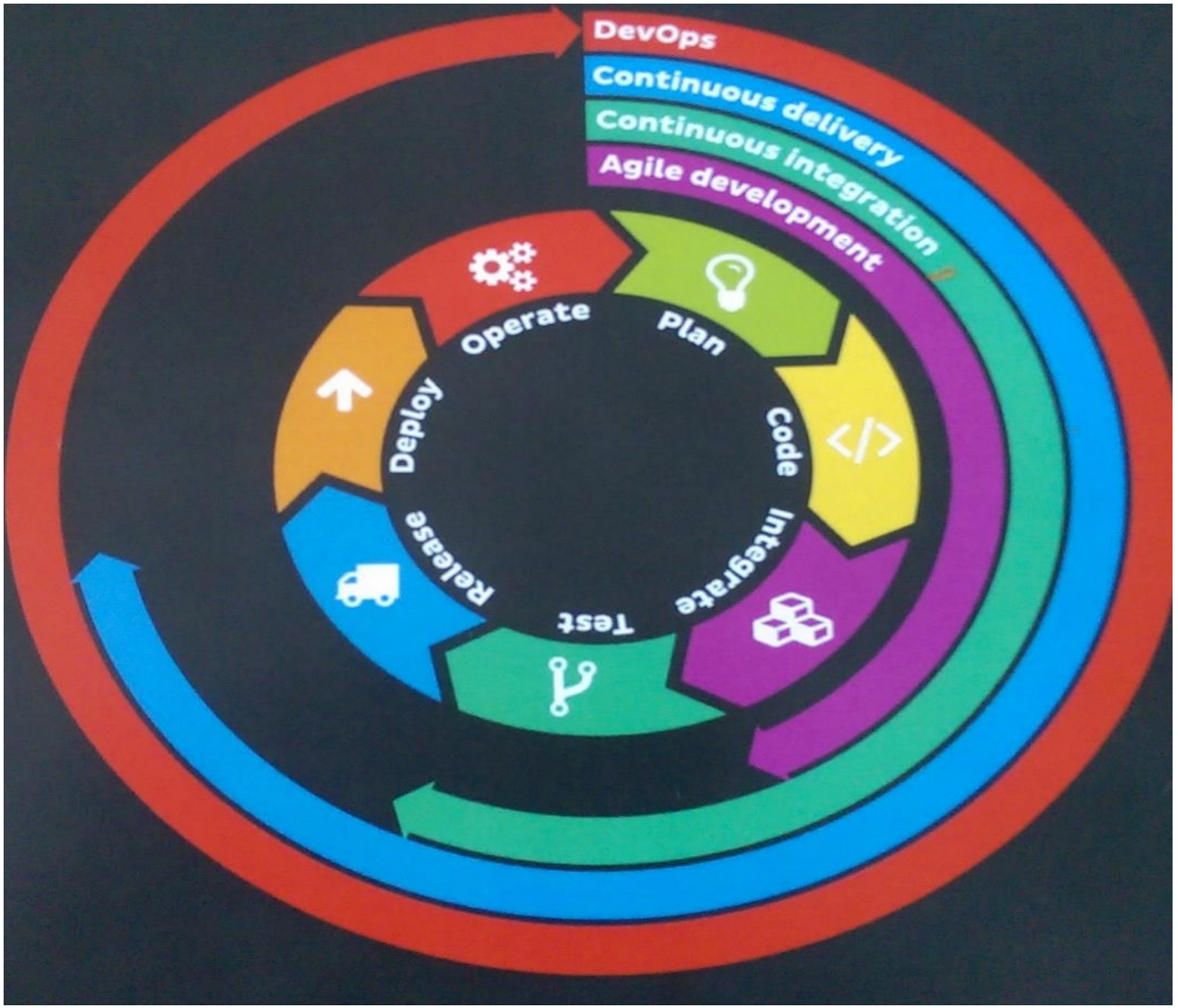
בהכנת החומרים נעזרתי בהרצאה של שאול בן מאור, Quali

What Are We Aiming For, in CICD frameworks



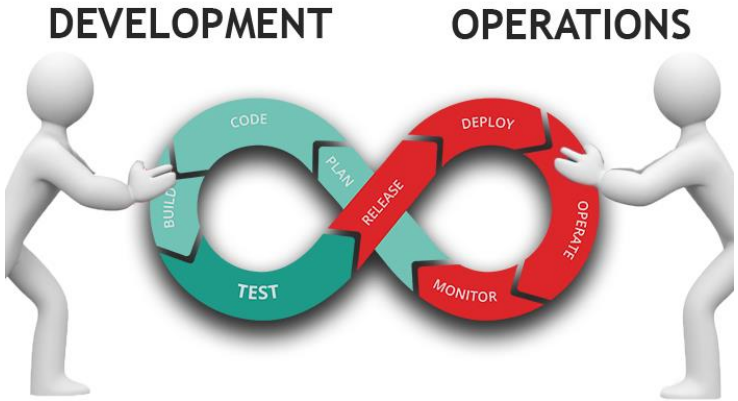
Establishing a repeatable, traceable, scalable framework that

- Enables fast, iterative development and testing
- Deploys apps seamlessly, securely, and safely
- Actively operates apps in production - bridge between deployment and monitoring systems

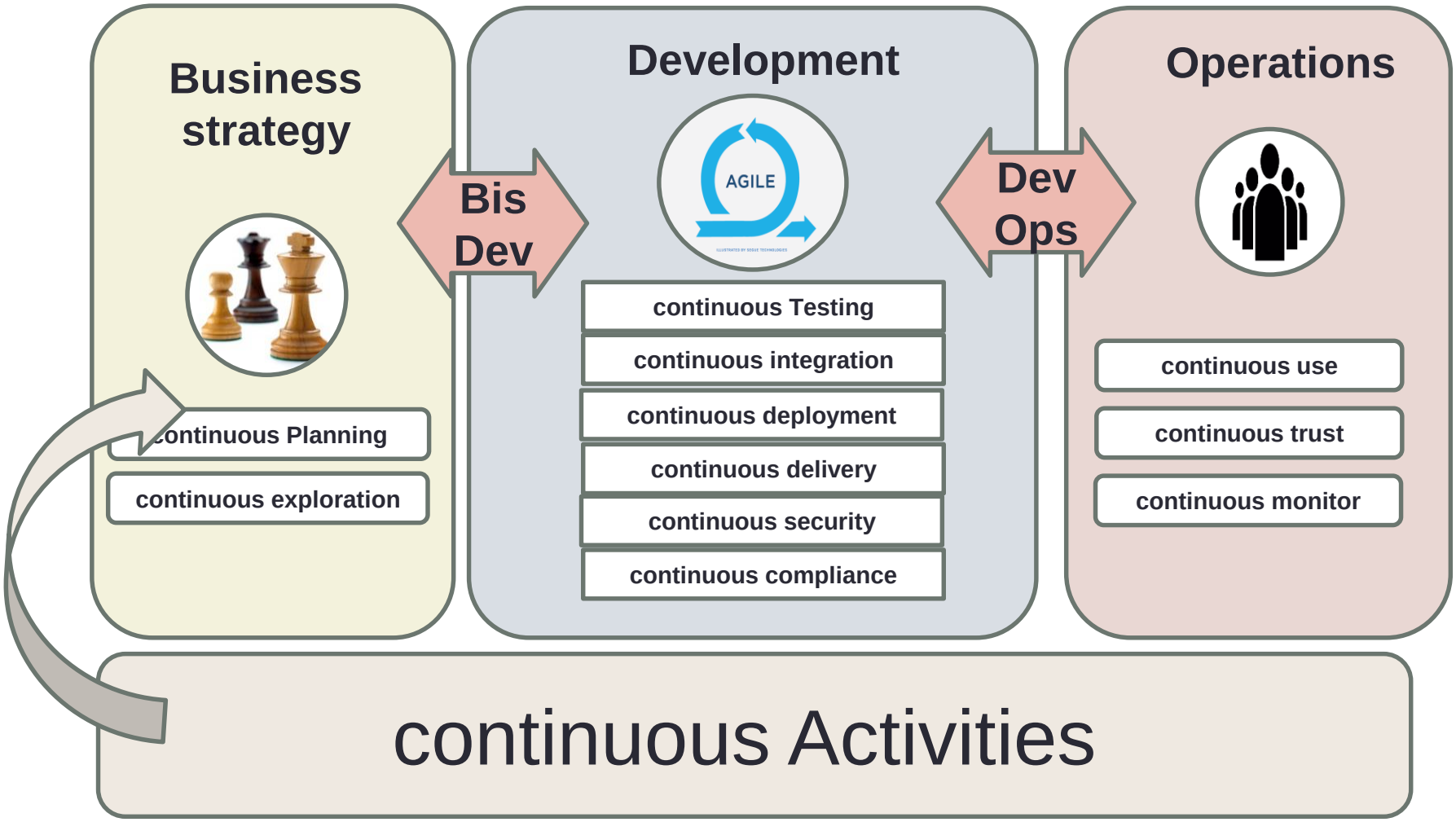

DevOps
Continuous delivery
Continuous integration
Agile development
Operate
Plan
Deploy
Code
Release
Integrate
Test

Development Methodologies – CI/CD/DevOps

- What is Continuous Integration
- What is Continuous Deployment
- So What is DevOps

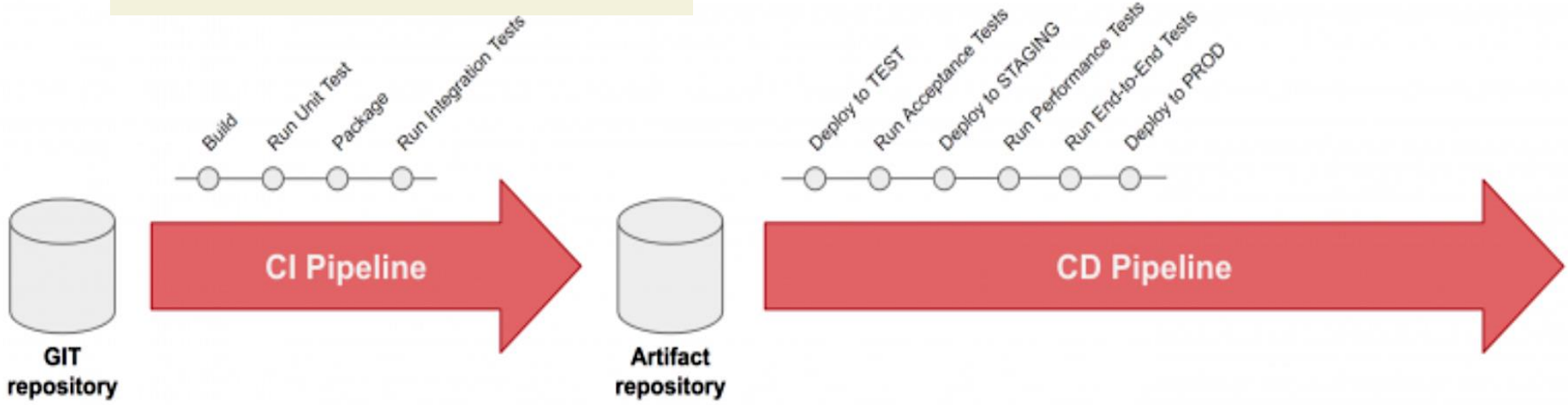


Continuous Activities- Holistic Approach



End2End DevOps Chain

- Requirements
- Development
- Source Control
- Automatic Build
- Automatic Testing
- Automatic Deployment



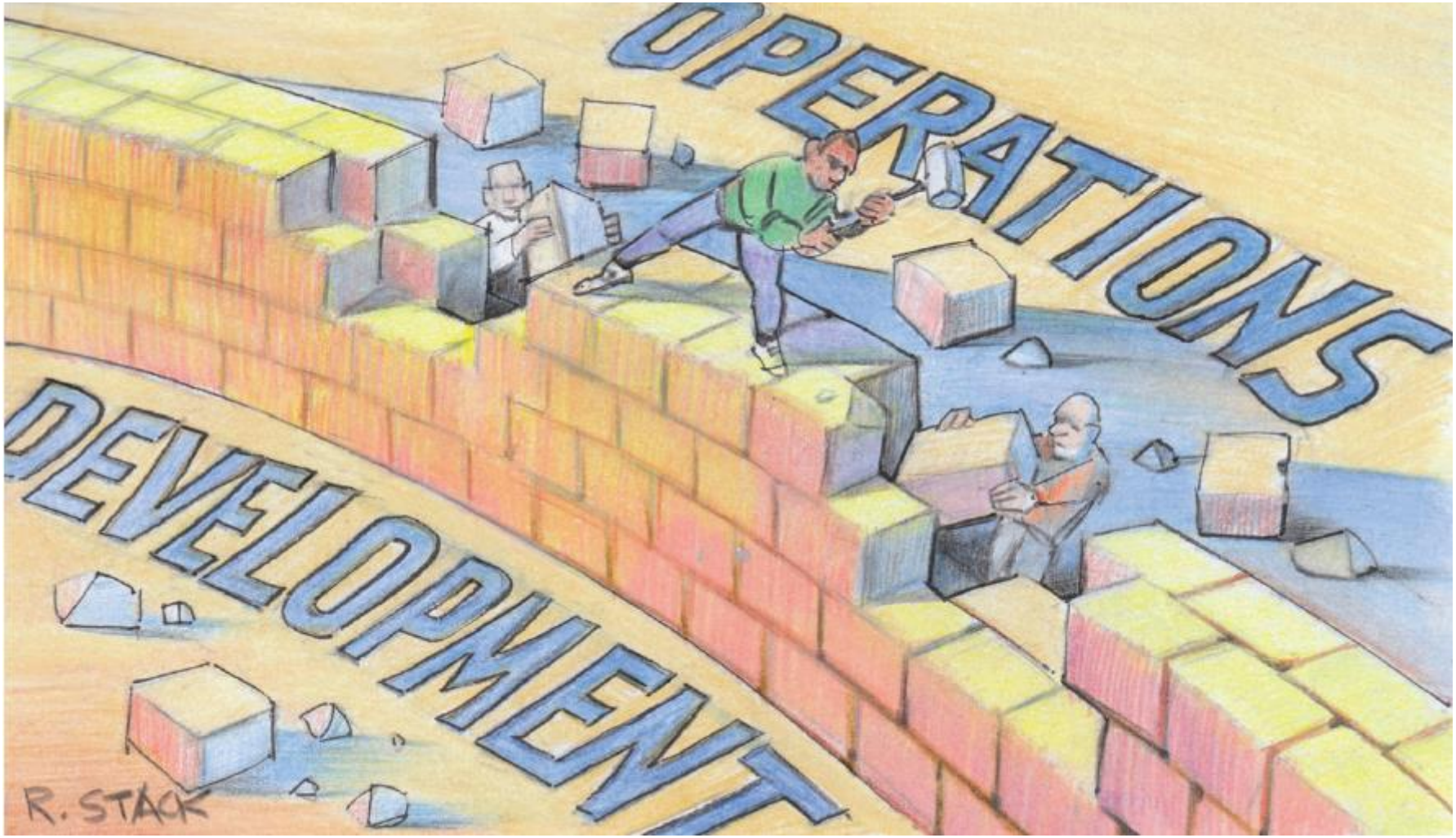
Red Hat

Continuous Integration (CI) and Delivery and Deployment (CD)

- Is a software strategy, that is based on a Continuous Delivery Pipeline, based on automated software production line
- The core idea of CD is to create a repeatable, reliable and incrementally improving processes for delivery and deployment
- Remember Agile principles, mainly the first Agile principle:
  - “Individuals and interactions over processes and tools” (Verona 2016).

Organizational Implications

- Organization structure
- How does it affect the SDLC
- Management processes
- Quality implications
- Employees career
- Relations with the customer


OPERATIONS
DEVELOPMENT
R. STACK

Development Operations (DevOps)

- Fast, flexible development and provisioning business processes.
- Efficiently integrates development, quality assurance, delivery and operations into one silo
- Using automation for development deployment and monitoring infrastructure.

Maven (Java) Pipeline Basic Example

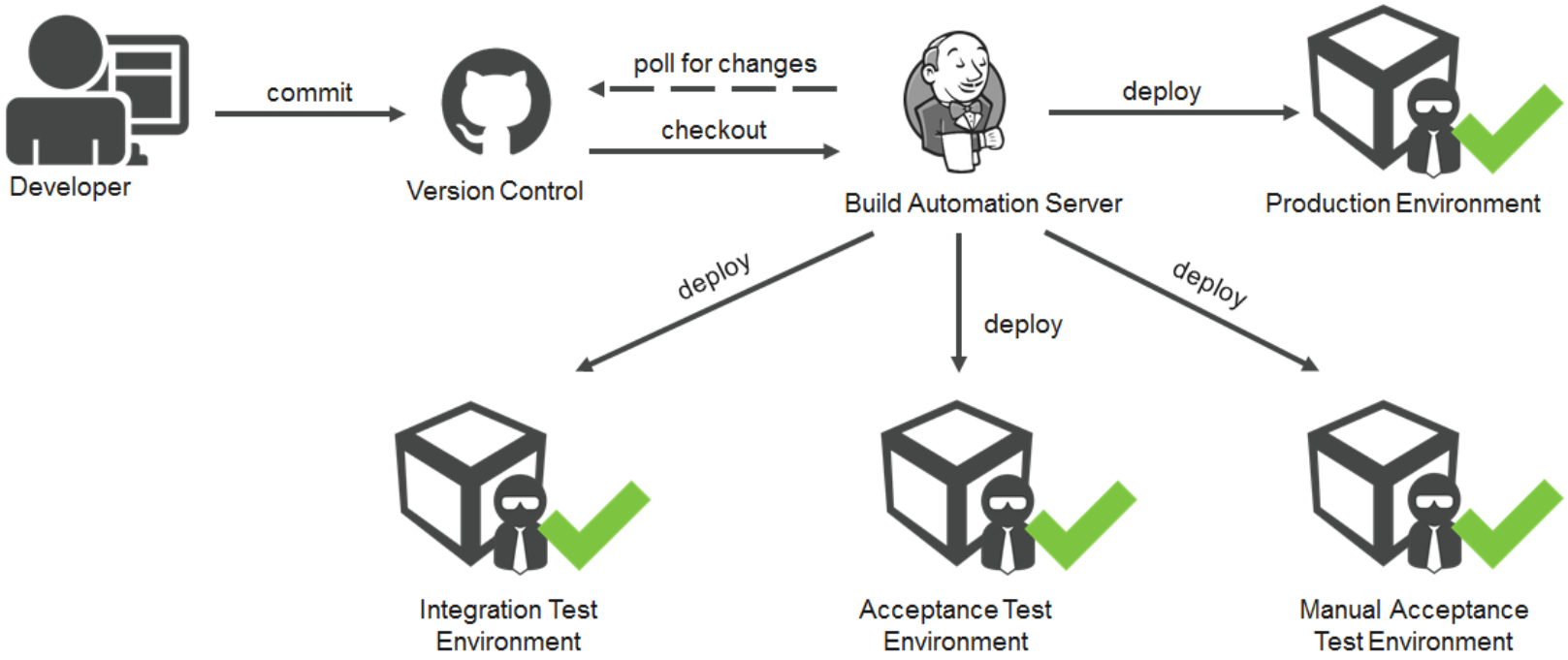
BUILD →

UNIT TEST →

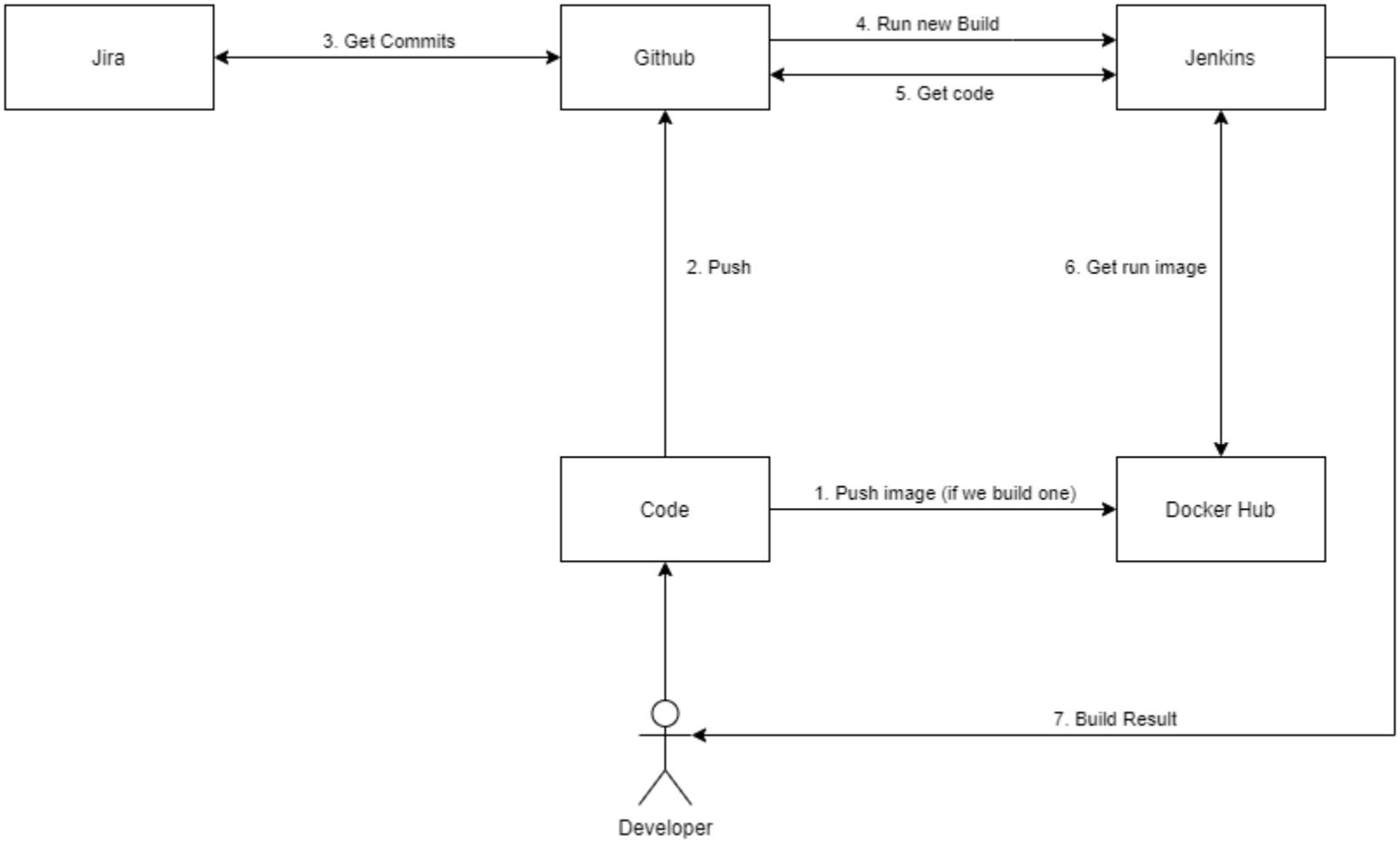
```
pipeline
{
    agent {
        docker {
            image 'maven:3-alpine'
            args '-v /root/.m2:/root/.m2'
        }
    }
    stages {
        stage('Build') {
            steps {
                sh 'mvn -B -DskipTests clean
package'
            }
        }
        stage('Test') {
            steps {
                sh 'mvn test'
            }
            post {
                always {
                    junit 'target/surefire-
reports/*.xml'
                }
            }
        }
        stage('Deliver') {
            steps {
                sh
'./jenkins/scripts/deliver.sh'
            }
        }
    }
}
```

WHAT ELSE IS NEEDED?

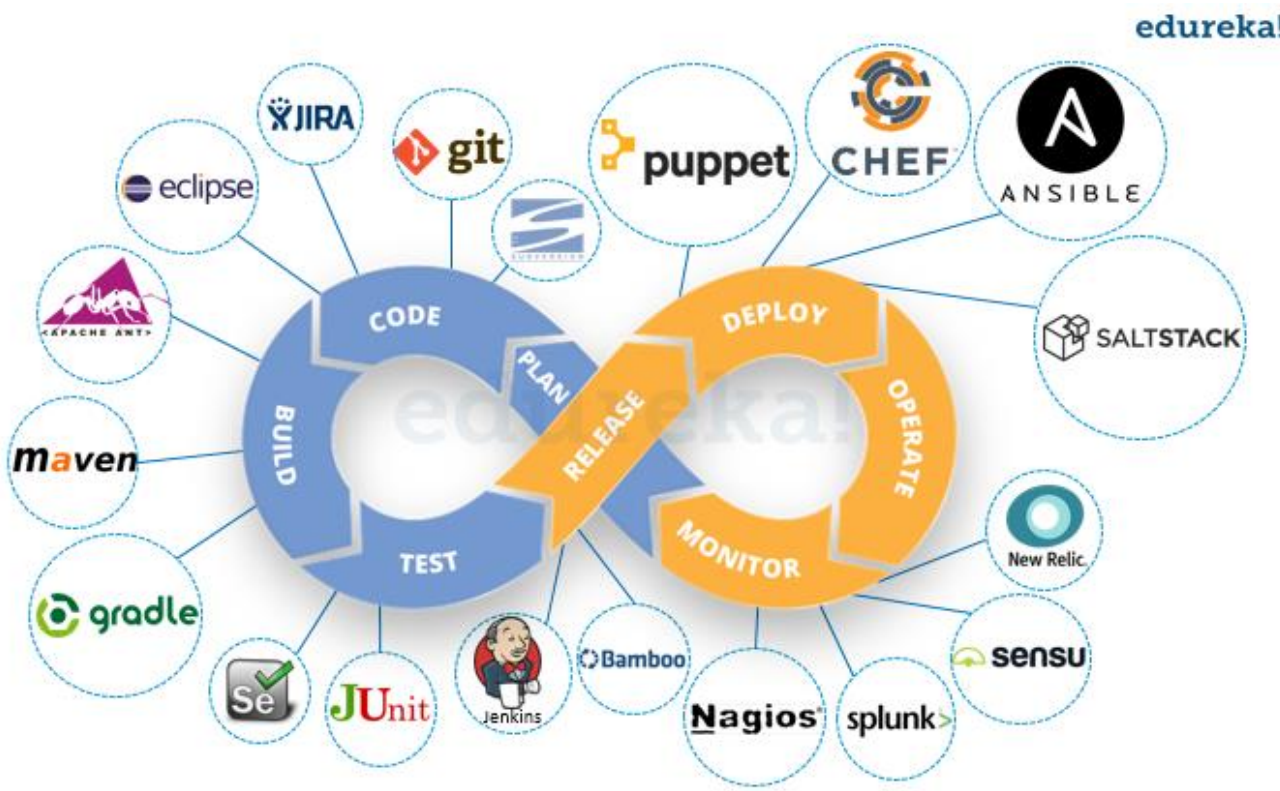
CICD Practices



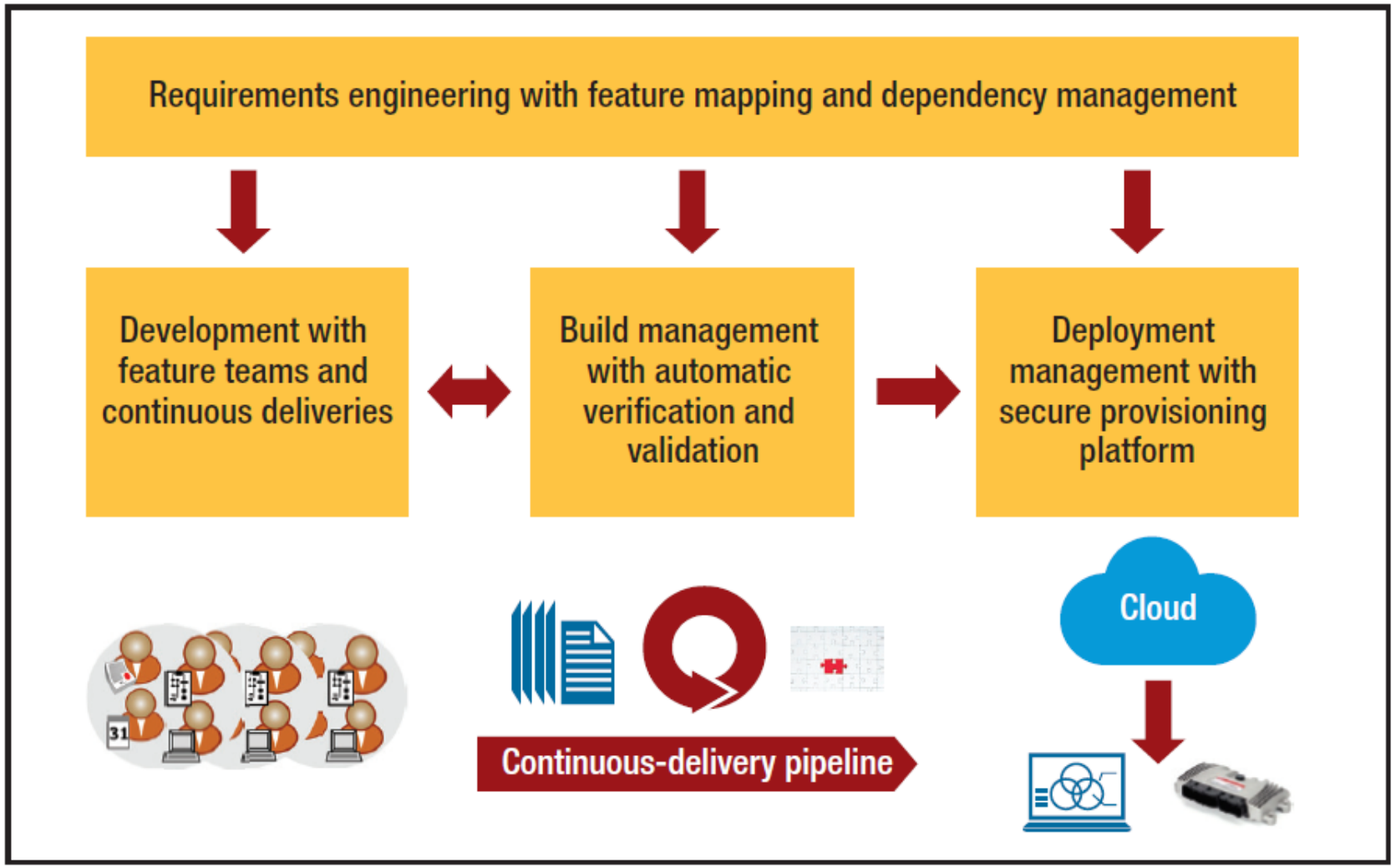
Our Course Environment



DevOps Common Tools



DevOps Production and Delivery Processes



Ebert, C., Gallardo, G., Hernantes, J., & Serrano, N. (2016). DevOps. *Ieee Software*, *33*(3), 94-100.

DevOps Benefits

- Less stressful and faster deployments.
- Customer and employee satisfaction.
- Lesser roll backs.
- Better performance of both people and systems.
- Budget control.
- Faster resolution of problems.
- More stable operating environments.
- Advantage over rival companies that do not do DevOps.
- Minimized deployment related downtime.

Amaradri, A. S., & Nutalapati, S. B. (2016). Continuous Integration, Deployment and Testing in DevOps Environment.

DevOps Challenges

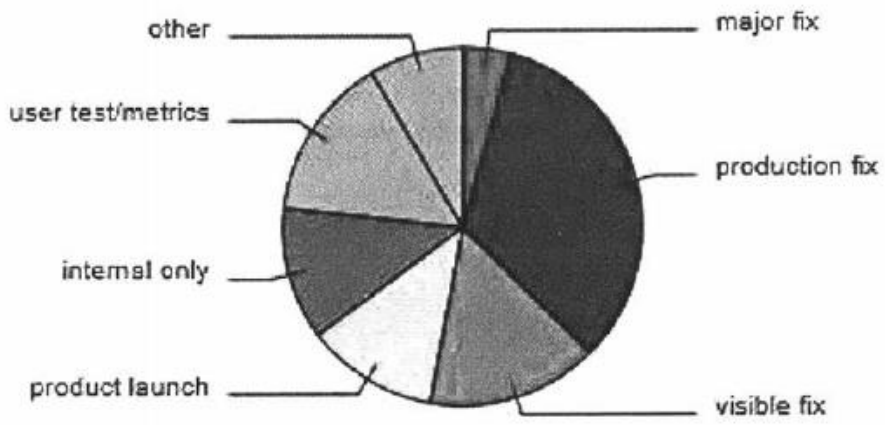
- Unawareness of right tools for doing tasks.
- Insufficient knowledge on how to change/simplify current architecture to suit better into modern time automated environment.
- Finding the right and experienced personnel

Amaradri, A. S., & Nutalapati, S. B. (2016). Continuous Integration, Deployment and Testing in DevOps Environment.

Facebook as a Case Study

- A single stable trunk of code
- An ability and mindset of fearlessness

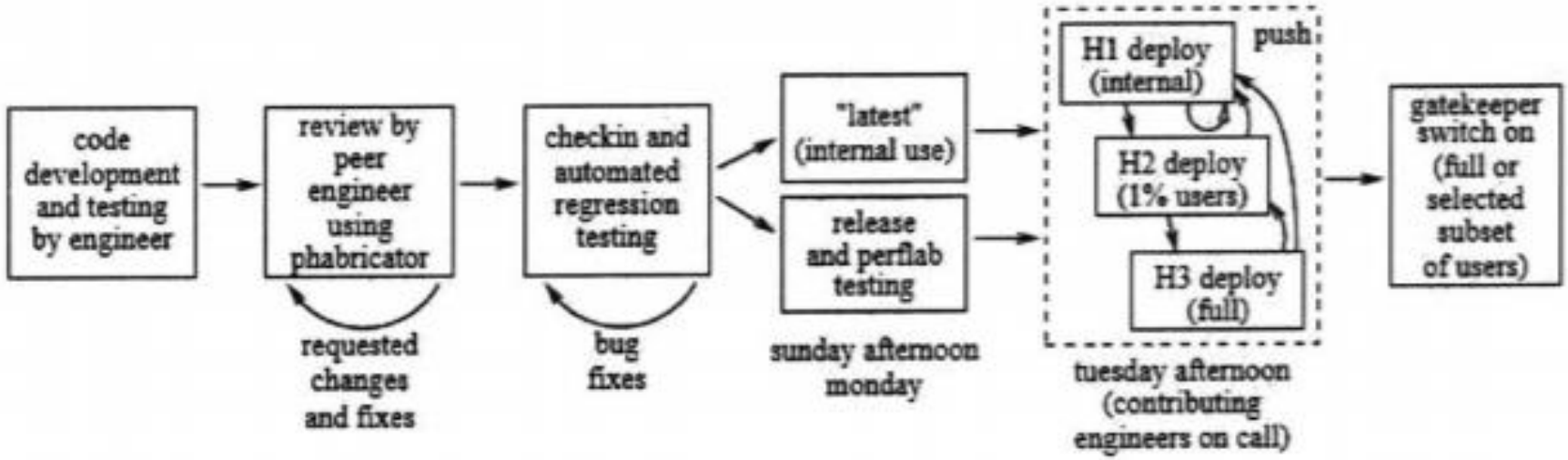
  towards frequent deployment
- Using "branch by abstraction”



- Gatekeeper- control which users see which features of

  the code

Facebook Pipeline



Dilemma of speed vs. scale in software system development best practices from industry leaders by Kshitij Kumar, 2017

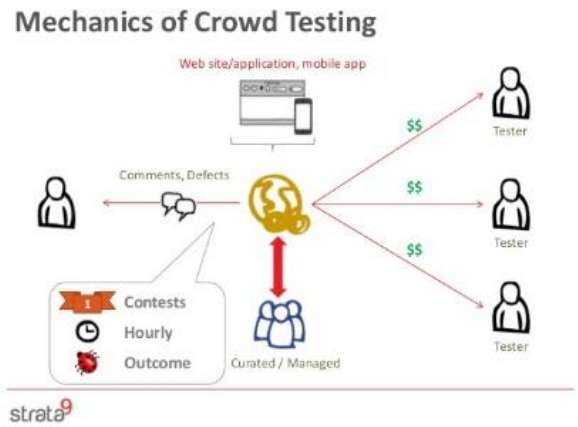
Facebook Best Practices

Dog-fooding – eat your own dog food

A/B testing –test on sectors/sections of users

Crowd testing – using the crowd wisdom

Conway's Law – organizations systems are constrained to create designs which mirror the communication structures
of their organizations

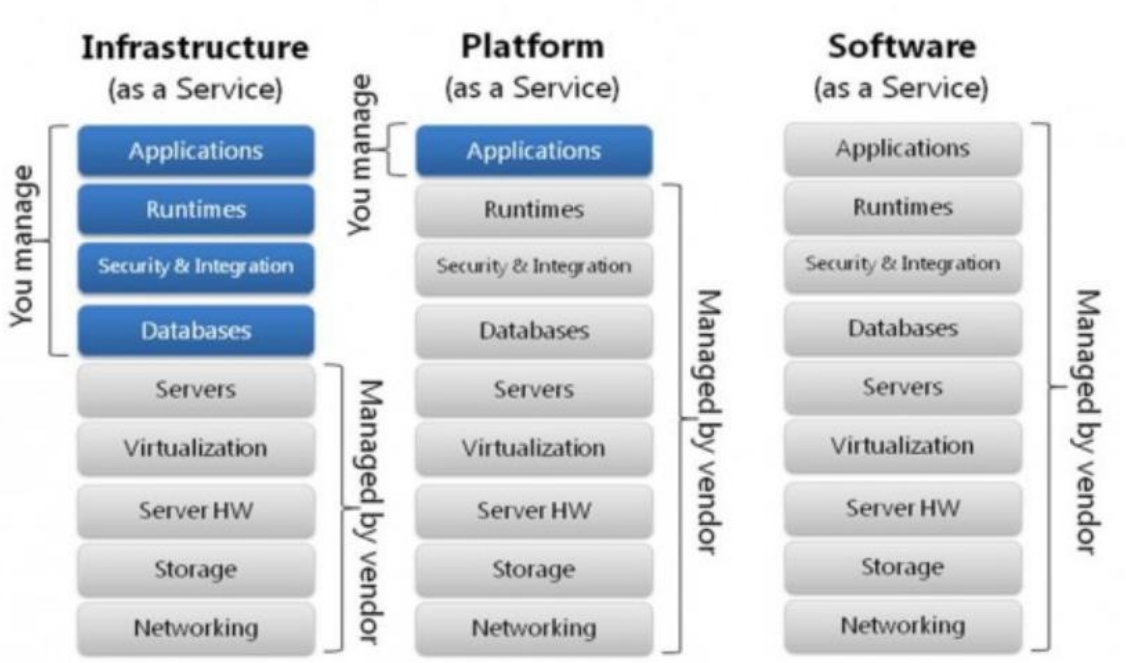


What is a Cloud Provider?

- Offers some component of cloud computing
  - Infrastructure as a Service (IaaS)
  - Software as a Service (SaaS)
  - Platform as a Service (PaaS)
- Tiny startups to global corporations, government agencies to non-profits
- Amazon was the first major cloud provider, with the 2006 offering of Amazon Simple Storage Service (Amazon S3).

Types of cloud services: IaaS, PaaS, SaaS

- Infrastructure-as-a-service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)



What We Can Do With It?

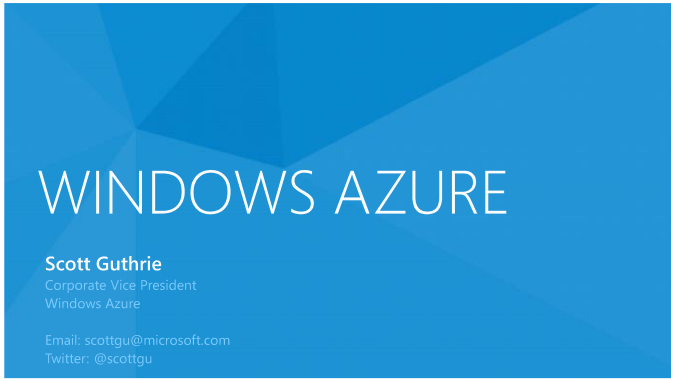
- Create new apps and services
- Store, back up, and recover data
- Host websites and blogs
- Stream audio and video
- Deliver software on demand
- Analyze data for patterns and make predictions

Why cloud?

- Cost reduction
- Speed
- Performance
- Reliability

Types of cloud deployments

- **Public cloud**
- **Private cloud**
- **Hybrid cloud**



AWS

תודה על ההקשבה!