Fpt Software

Introductory Material
DEVOPS FOUNDATION

a presentation for FCU

About Trainner

- ✓ **Trainner**: QuyetVC – QuyetVC@fsoft.com.vn
- ✓ **Position**: Cloud - DevOps Leader in FHN – FPTSOFTWARE
- ✓ **Slogan**

DevOps is culture, not a role!

Course Contents

SECTION 01 & 02- The Theory & Concept

- ✓ **Objective**

- ✓ **DevOps Overview**

  This course provides an introduction to the core values, principles and practices involved in implementing of DevOps solutions.

- ✓ **DevOps Transformation**

  + Learn about the challenges and the way to apply DevOps

- ✓ **Continuous Integration/ Continuous Deployment (Delivery)**

  + Learn about CICD concept, Pipelines
  + Sample about CICD – DevOps System

SECTION 03 & 04- Assignment

- ✓ **Assignment & Grouping 1-2 hour**

  + Explain and description about Assignments

  + Grouping

- ✓ **Team Work (3-4 hours)**

  + Research and discuss to define the way to implement the devops solution to the business in the secnario.
  + Create the presentation.

- ✓ **Presentation (2 hours)**

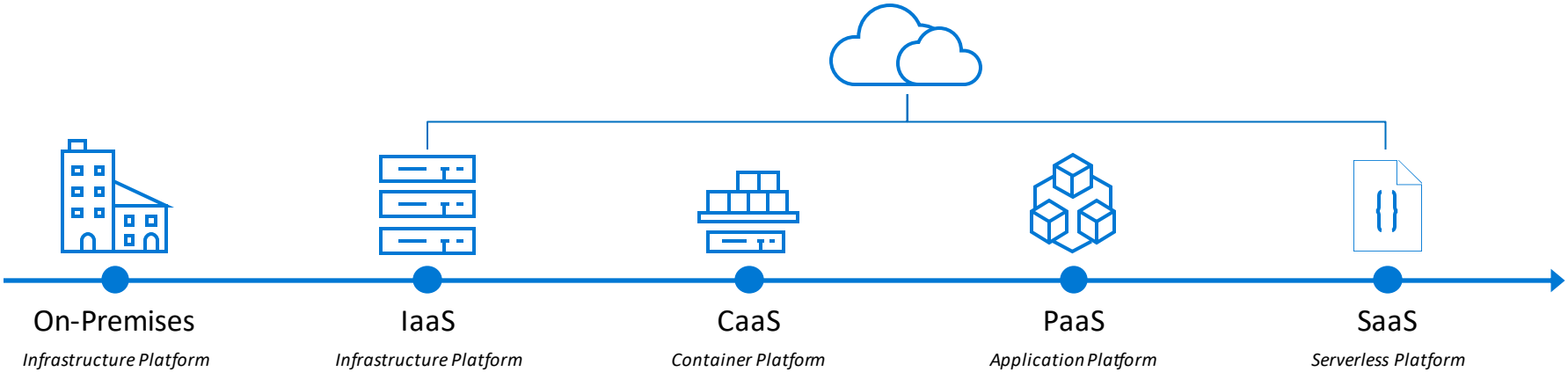
  + Presentation by Group
  + QnA

DevOps Overview

Software Development is shifting

Fpt Software

Past	Today
Long application cycles	AI driven rapid innovation
Monolithic apps	IoT, Bots, micro-services & containers
Servers and VMs	Serverless, Massively Parallel Processing (MPP)
Less data – structured data	Big Data – Unstructured, semi-structured and structured
Desktop	Mobile, Web
Distinct infrastructure and operations teams	Service-focused DevOps teams



Challenges in Application Development

Fpt Software

How can I deliver applications rapidly to market?

How can I easily and faster adapt & integrate applications with new technologies?

How can I accelerate to update, develop or try out new features?

How can I increase business continuity?

How can I automatically scale in/out applications to meet market demands?

How to improve customer satisfaction & customer experiences

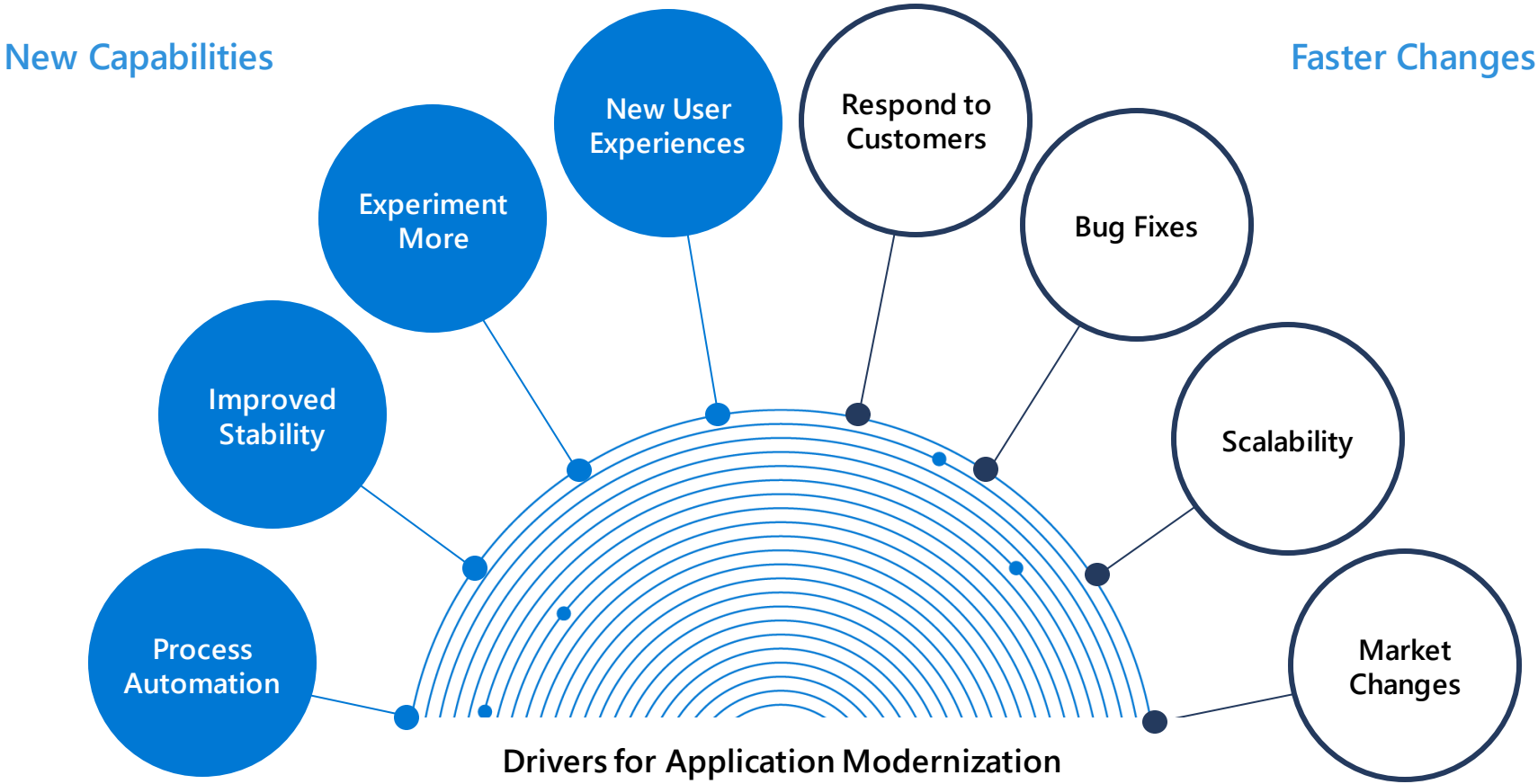
How can I consolidate monitoring the usage/performance of the huge distributed systems efficiently and alert incident automatically?

How can I improve the application quality and performance

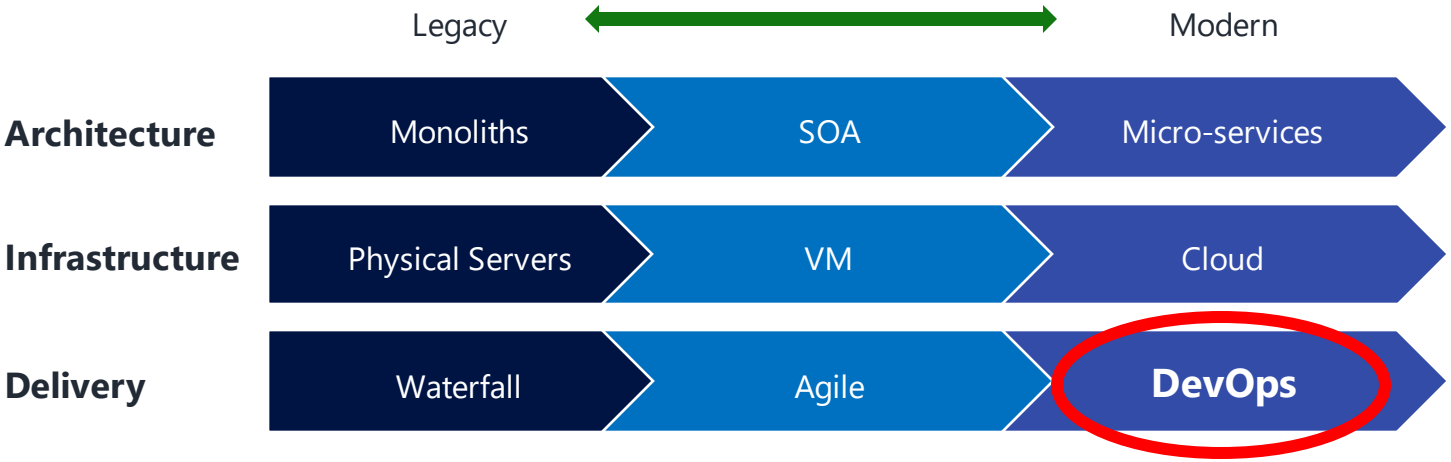
How can I reduce operational and maintenance costs?

Drivers for Application Modernization

Fpt Software



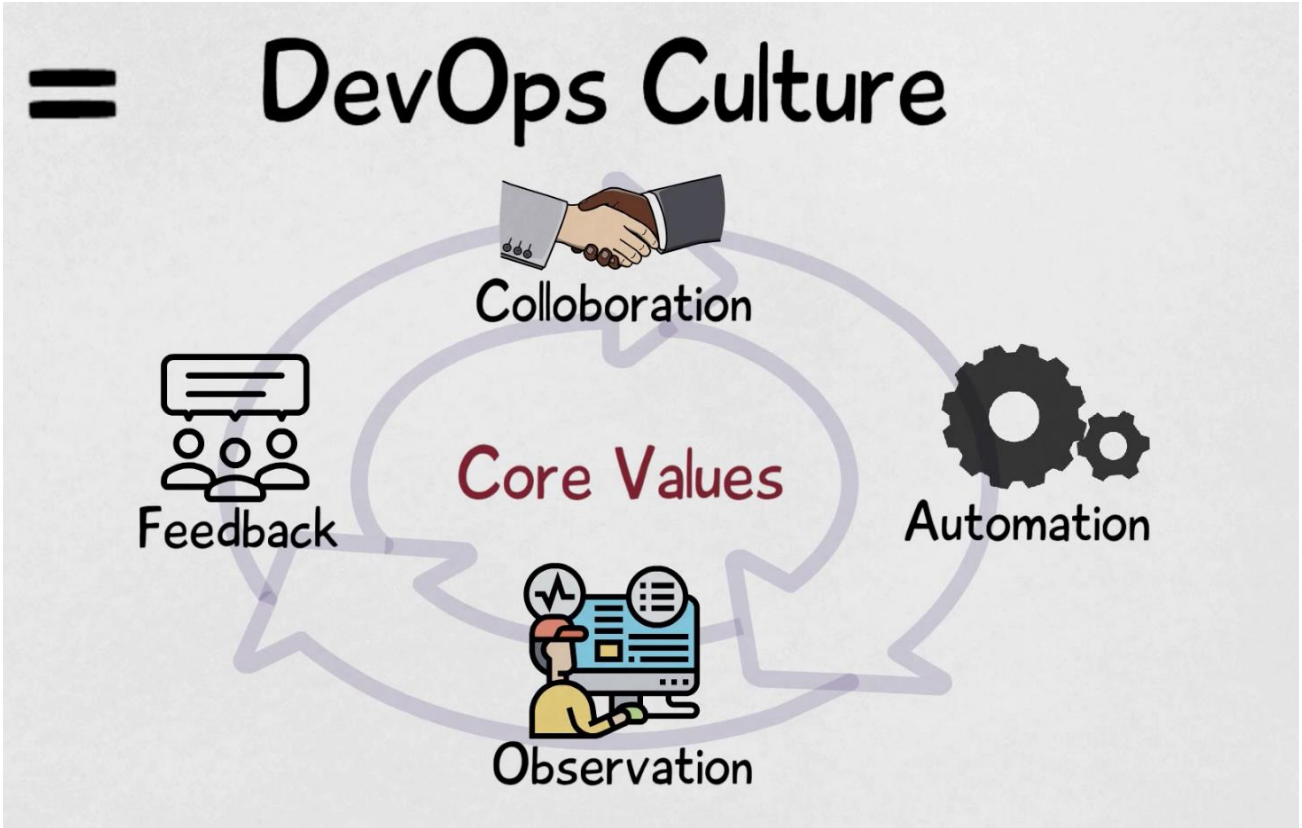
Shifting To DevOps Is Key



What Is DevOps?

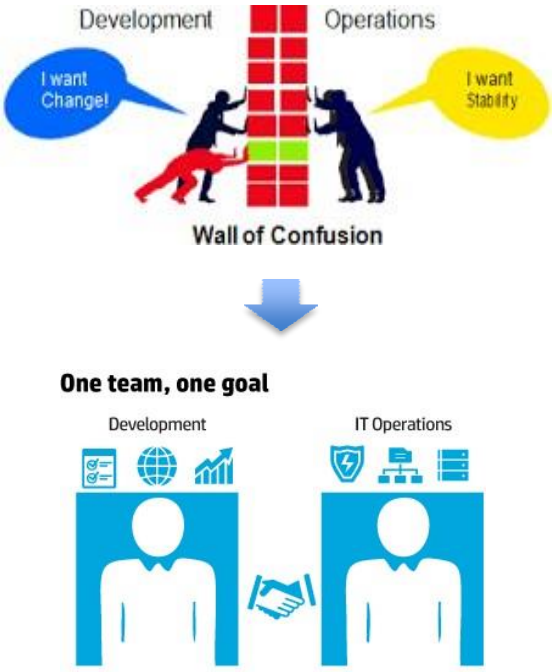
DevOps is practices & culture that aims to breakdown the barrier between Developers and Operators to deliver software better (faster, more efficient and more reliable) hence protect and improve customer experience.

DevOps Culture



History of DevOps

- In **2007**, it was ecognized that a lot of time and effort was wasted navigating the project between these two worlds.
- Later, in **2008** during an Agile conference, a discussion group has formed..
- In **June of 2009**, thanks to the talk entitled “10+ Deploys a Day: Dev and Ops Cooperation at Flickr.”, the developers and system administrators together and discuss the best ways to start bridging the gap between the two disparate fields.
- The event DevOpsDays, occurring in the last days of **October in 2009** and the hashtag was soon shortened to simply **DevOps** over Twitter. (and finally, in March of **2011**)



Goals of DevOps

DevOps aims at shorter development cycles (agile), **increased deployment frequency**, and more **dependable** releases, in close alignment with business objectives.

THE VERY BEST DEVOPS COMPANIES

1. Amazon

*To publish code changes, bug fixes and other additions whenever they like, which created **a huge competitive advantage**. They even have their own department for DevOps within AWS.*

*Amazon **1079 max deploys in a single hour** and experience both fewer and shorter outages.*

2. Facebook

*Facebook was actually one of the very first advocates of DevOps and they have worked hard to **update and improve its service without downtime**. Companies that cannot keep up with this new standard will most likely fall far behind and have a hard time catching up with those who can.*

3. Netflix

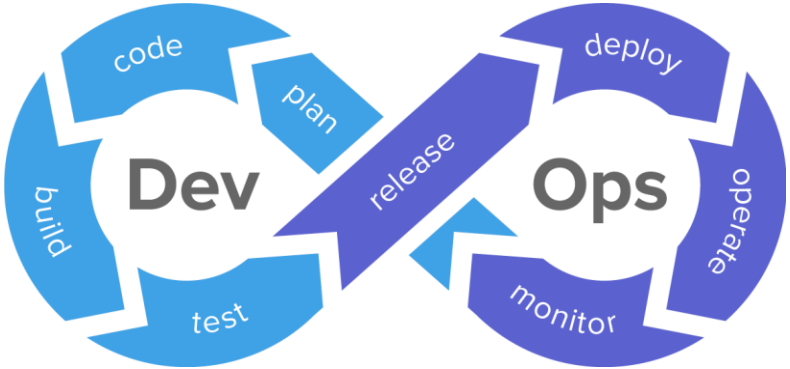
The Netflix streaming service is a grand distribution system based on the Amazon Web Services mentioned above.

*Today, Netlifx **publishes new code thousands of times per day**.*

4. Walmart

*Walmart has been the king of physical retail for a long time. Walmart created WalmartLabs in 2011 and today use DevOps as an **important part of innovation**.*

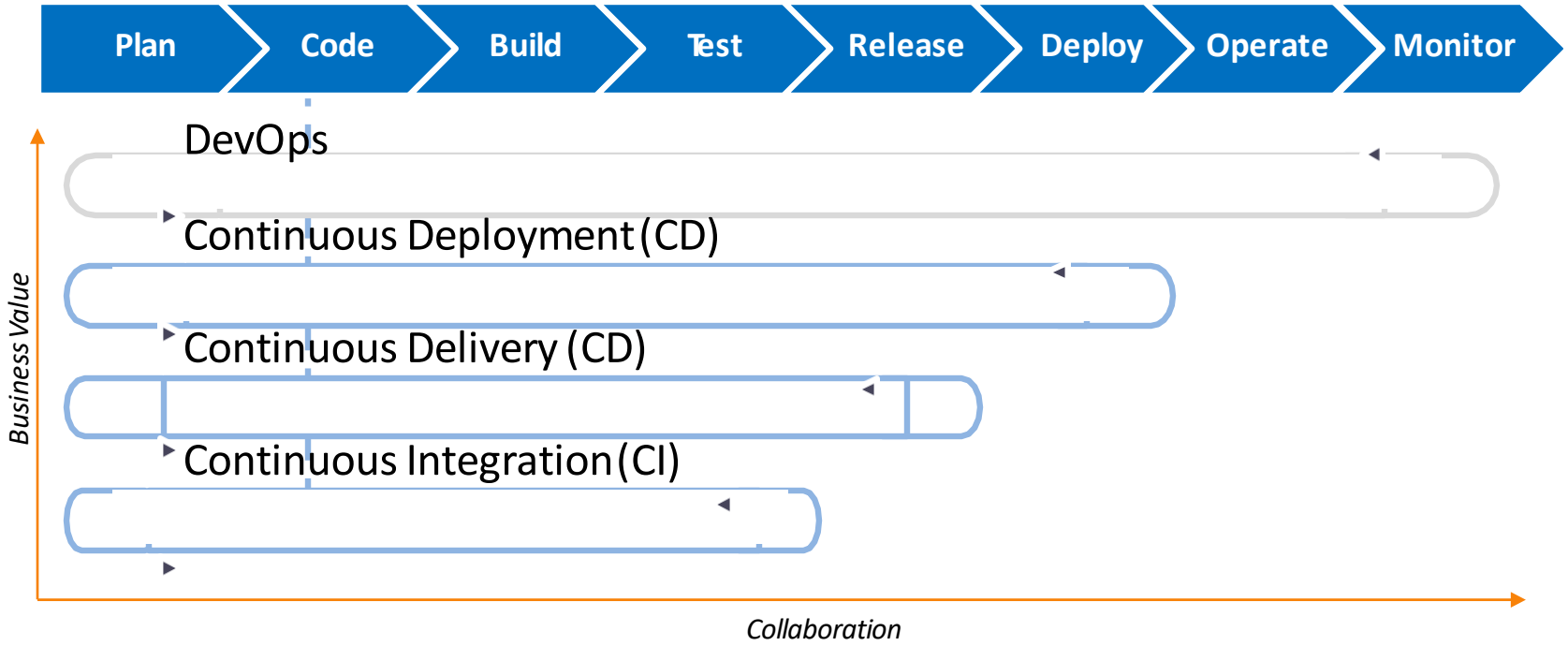
DevOps Lifecycle



- **Plan**: task and schedules management
- **Code**: version control, code review and scan
- **Build**: build status, packing and artifact repository
- **Test**: quality assurance of development through testing
- **Release**: change management, release approvals and move
- **Deploy**: infrastructure installation, app deployment, infrastructure/app configuration
- **Operate**: infrastructure/app management, high availability (HA), log/backup management, database management…
- **Monitor**: service performance monitoring, log monitoring, incident management and customer feedback.

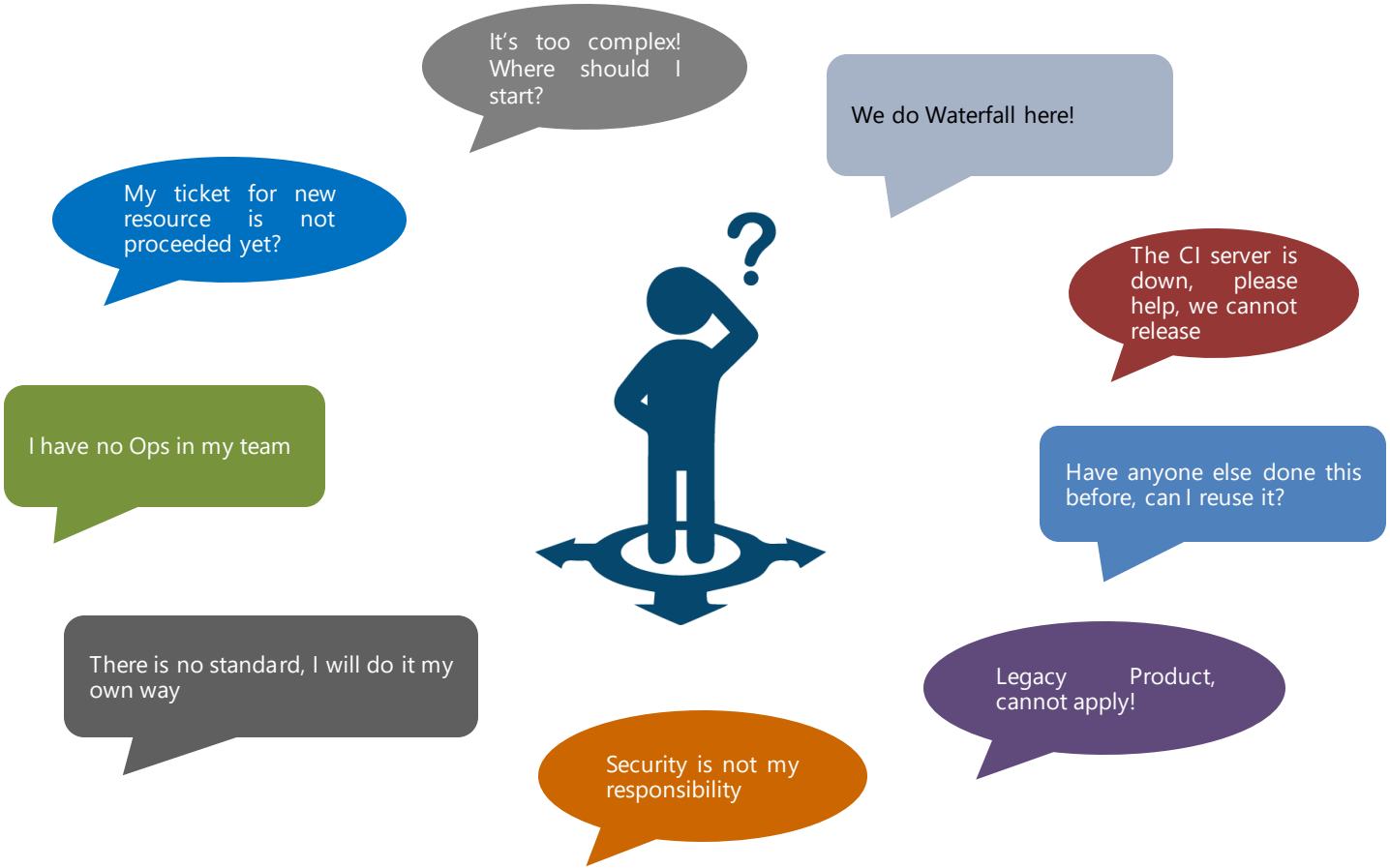
Pipelines in DevOps Lifecycle

The popular pipelines working on DevOps lifecycle



DevOps Transformation

Challenges in DevOps Adoption



Top 6 Challenges

Fpt Software

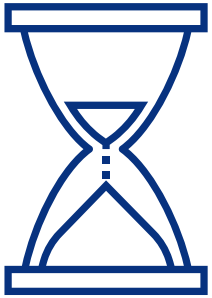
Complexity

Cultural Changes

Lack of Standardization

Lack of Expertise & Experience

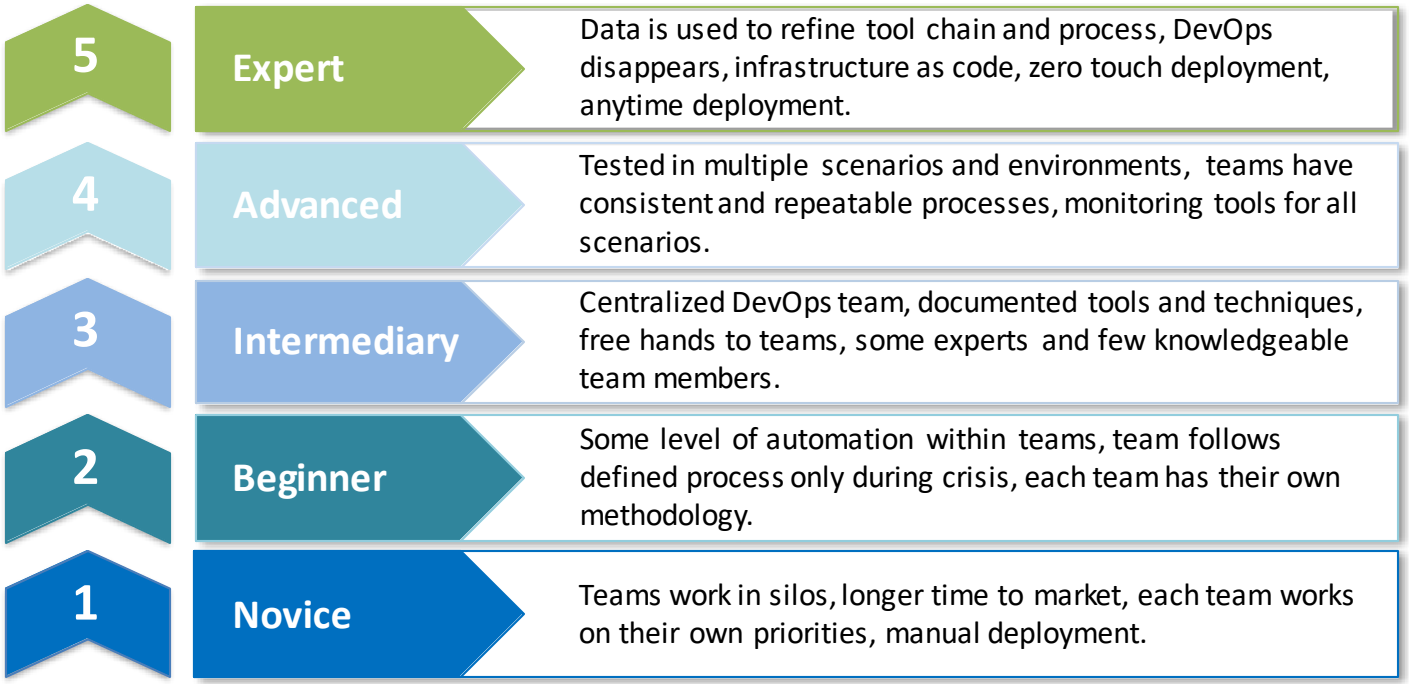
Lack of Time



Security is not Job Zero

DevOps Maturity Scale

Implement the appropriatelevel



Benefits of Moving to DevOps

There are technical benefits

- *Continuous software delivery*
- *Less complexity to manage*
- *Faster resolution of problems*

There are cultural benefits

- *Happier, more productive teams*
- *Higher employee engagement*
- *Greater professional development opportunities*

And there are business benefits

- *Faster delivery of features*
- *More stable operating environments*
- *Improved communication and collaboration*
- *More time to innovate (rather than fix/maintain)*

Prepare For Your DevOps

- ✓ Align with **business goals**
- ✓ Characterize your **existing environment**
- ✓ Get buy-in from all **stakeholders**
- ✓ Get comfortable with development tools
- ✓ Identify and eliminate **manual processes**
- ✓ Implement a comprehensive **governance model,** because doing DevOps means blurring the lines between development and operations team.

Approach To Apply DevOps

Fpt Software

DevOps Adoption & Evolution Journey with FPT Digital Kaizen™

DevOps Assessment

Phase 0

Determine current baseline and target vision of DevOps

- Current State:
  - Software Development Life Cycle (SDLC)
  - Process & Automation Tooling
  - Operations
  - Platform
  - Security & Compliance
- Define DevOps Target Vision and established Roadmap

Decision Gate

DevOps Adoption Planning

Phase 1

Build the Foundation

- Vision & Roadmap Established
- MVP Implementation Design:
  - Standardized Pipeline Toolchain & Environment
  - Standardized Pipeline Stages
  - Standardized Quality Gates
  - Standardized Dashboard
  - Supported Environments, Languages, Frameworks & Deployment Targets
- Define Governance Model

Decision Gate

DevOps Execution

Phase 2

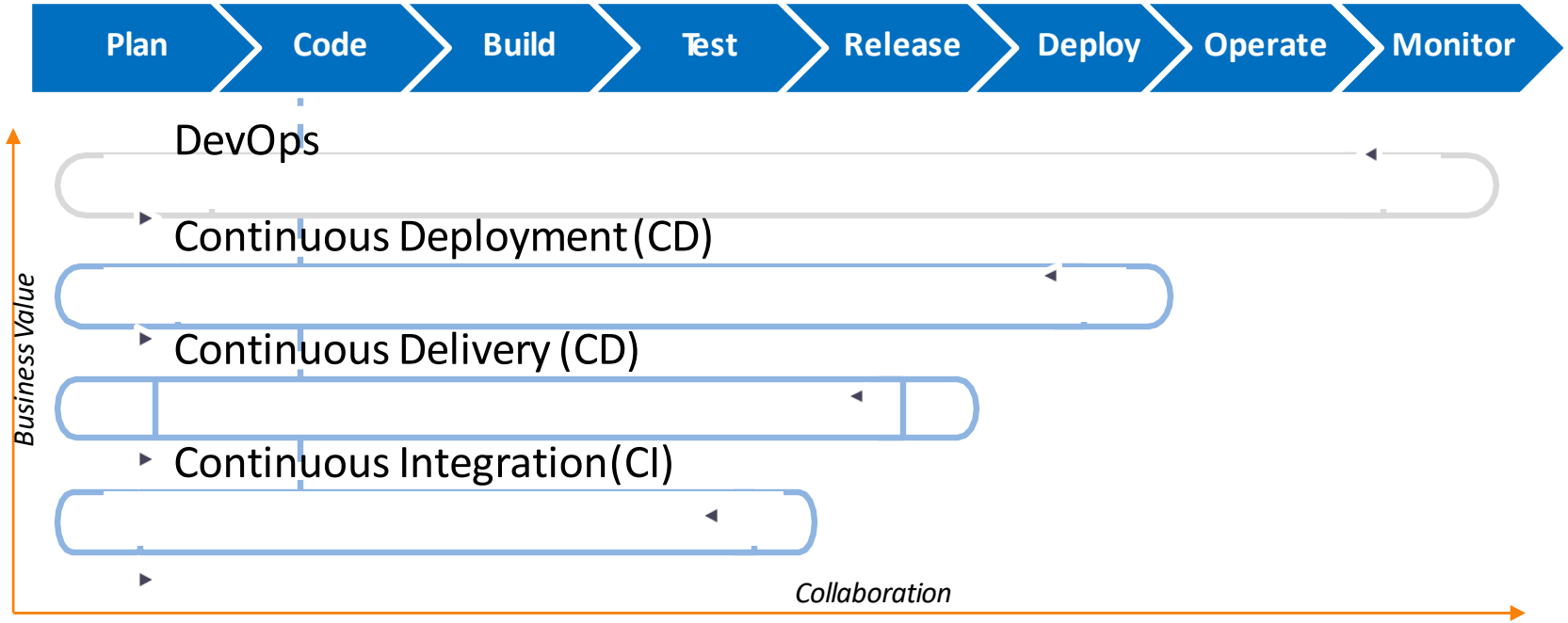
Achieve Business Objectives

- POC: Start adopting with 1 project
- Build DevOps Community
- Build DevOps Culture
- Continuous Optimize

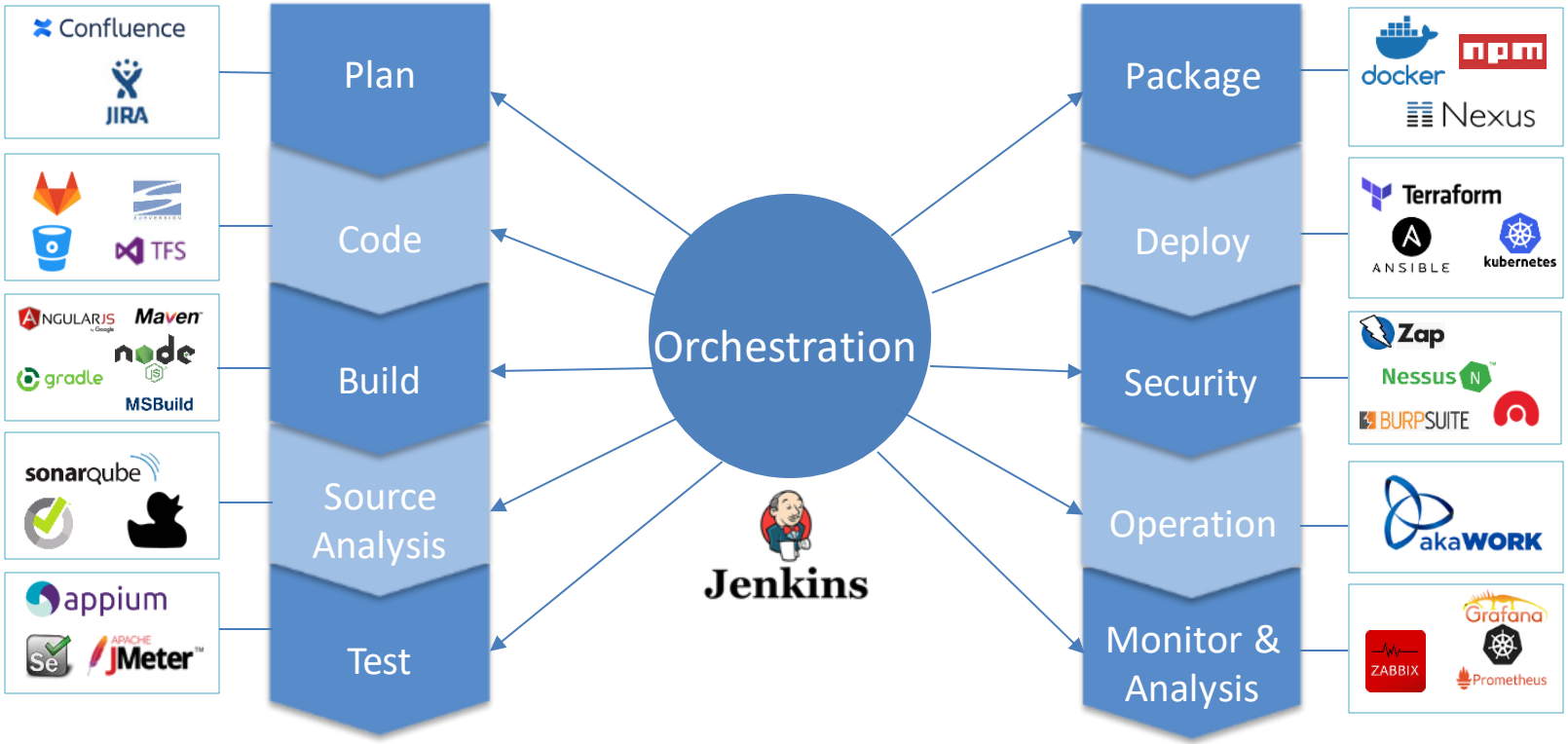
Self Service Platform for Digital Software Delivery

Pipelines in DevOps Lifecycle

The popular pipelines working on DevOps lifecycle



DevOps Toolchains



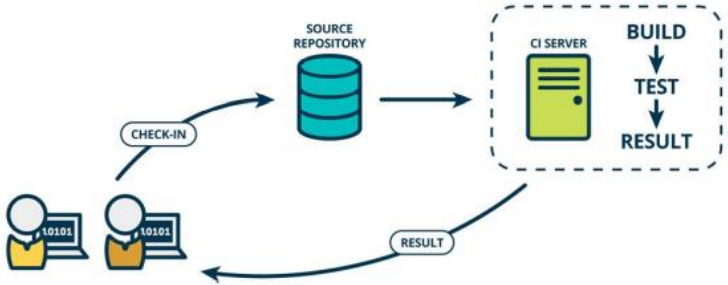
CICD - Pipelines

Continuous Integration

Continuous Integration is a software development practice where members of a team integrate their work frequently.

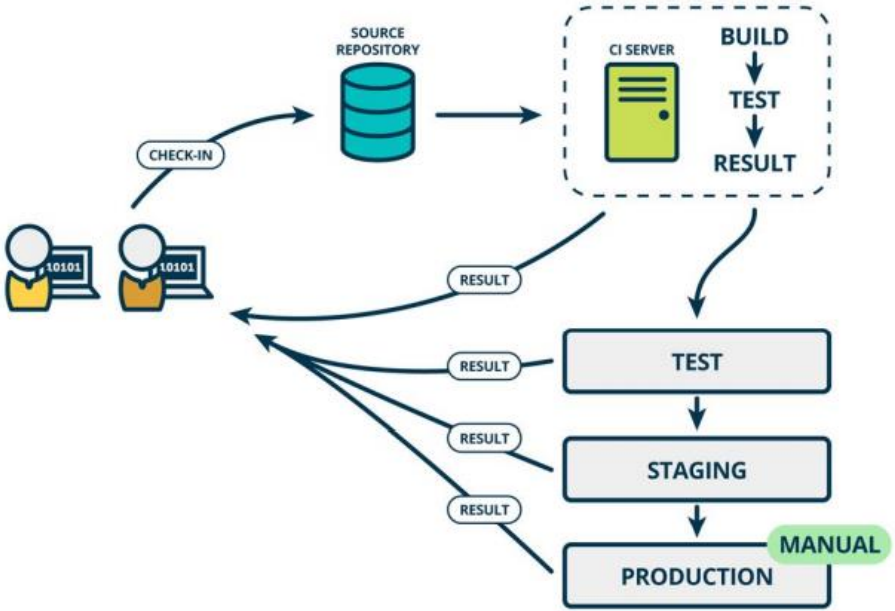
Every commits/changes made to a shared repository must be run through set of test cases to make sure new changes are accepted.

The result of that run should be informed to responsible persons.

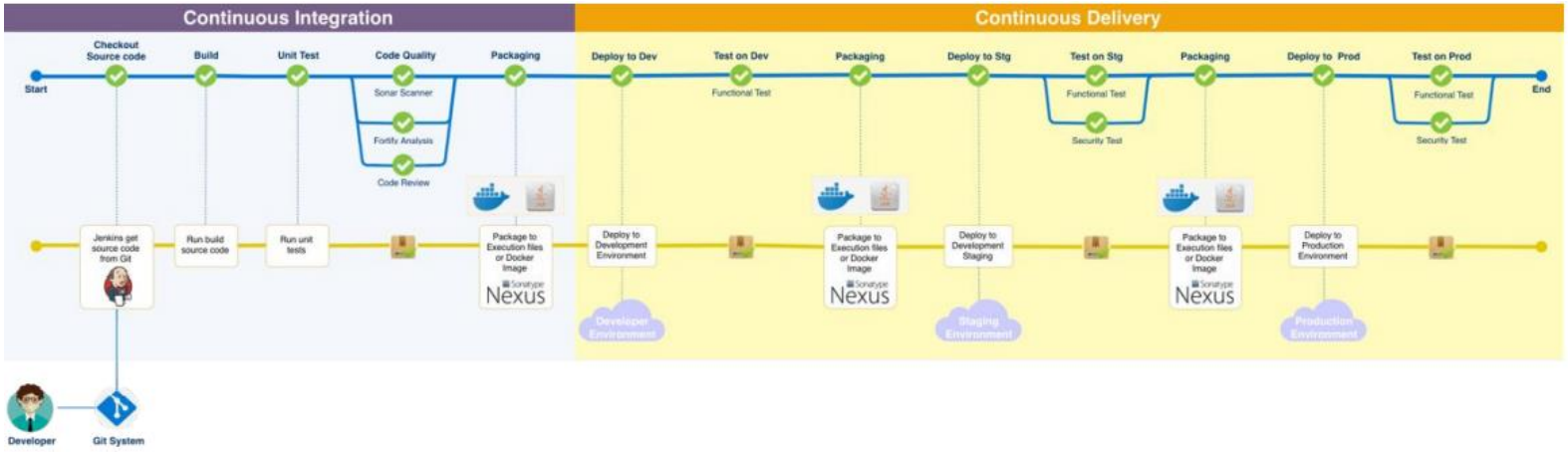


Continuous Delivery

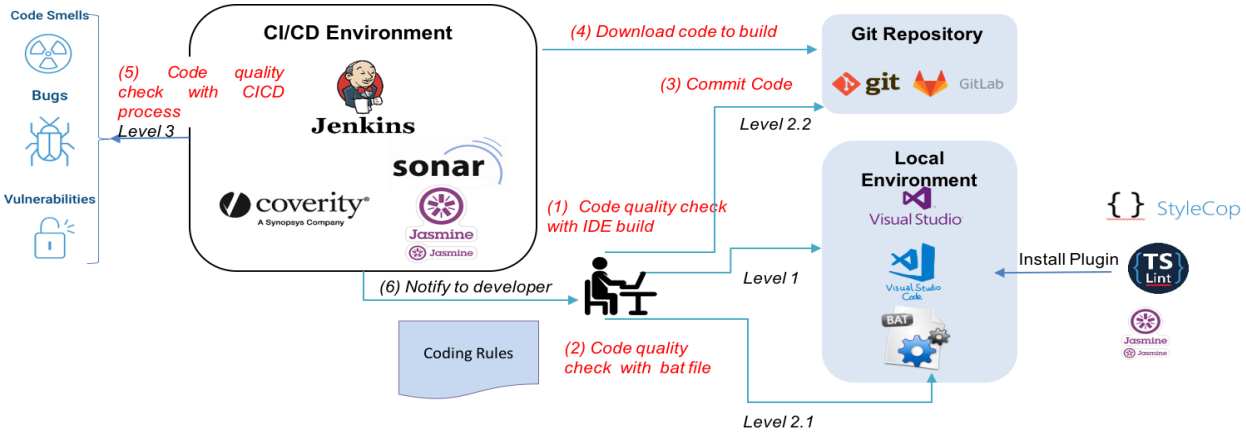
Continuous Delivery is the ability to continuously deliver integrated code, be it bug fixes or new features, to production. Software can be deployed at any given time.



Continuous Integration



CICD Sample System



3 Levels of code review

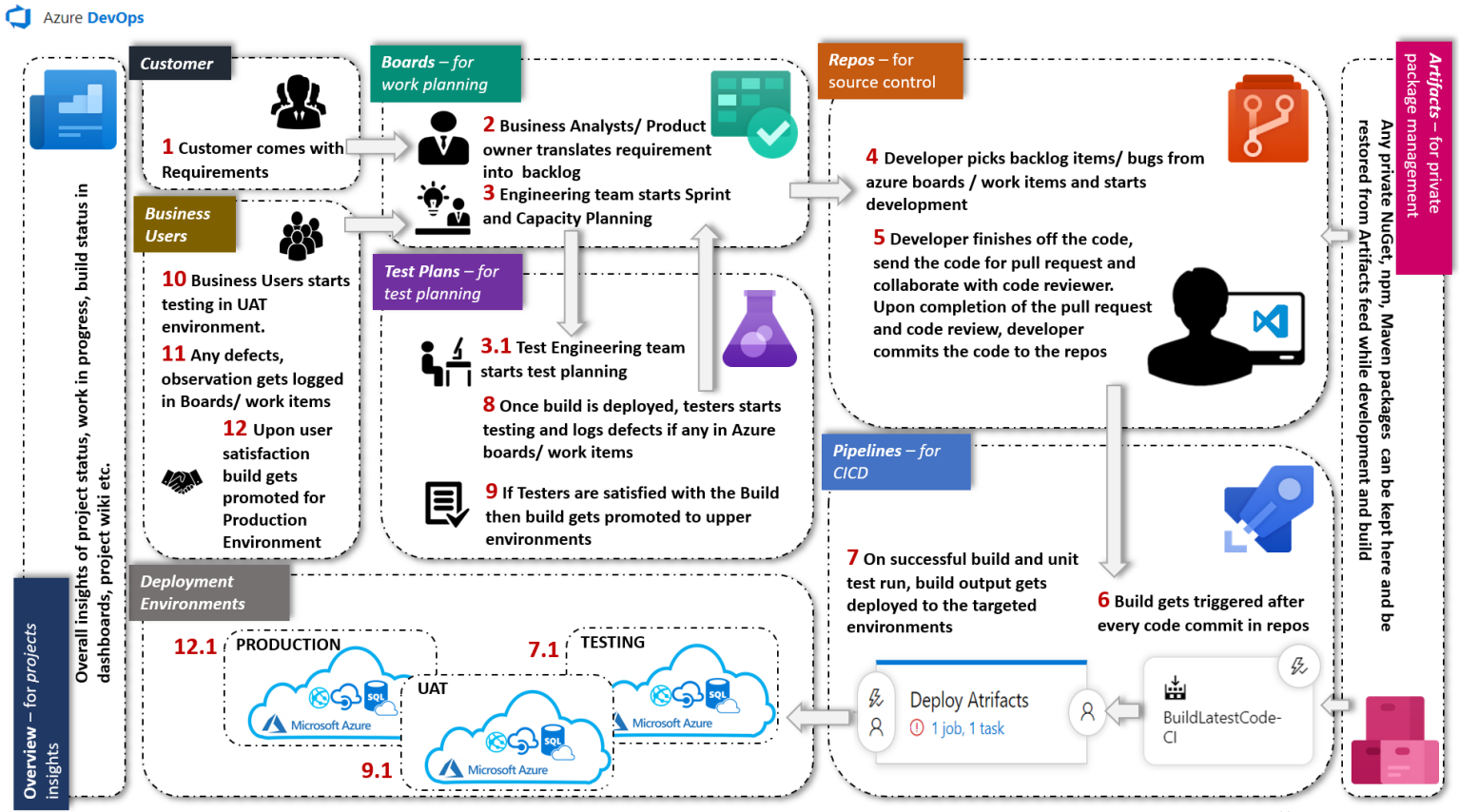
- Level 1, 2 : Conduct manually by IDE Build and Scripting
- Level 3: Apply CI/CD in **code quality control** by tools Jenkins, Coverity, Sonar, Protecode

Key words

- Automation Checklist
- Continuous Improvement
- Preventive Process
- Distributive Process

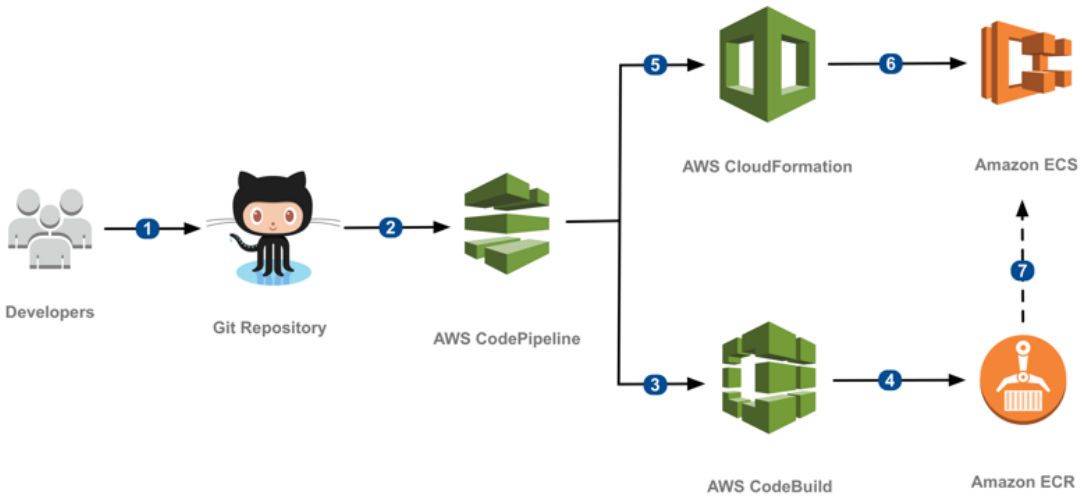
Azure DevOps

Fpt Software



http://subhankarsarkar.com

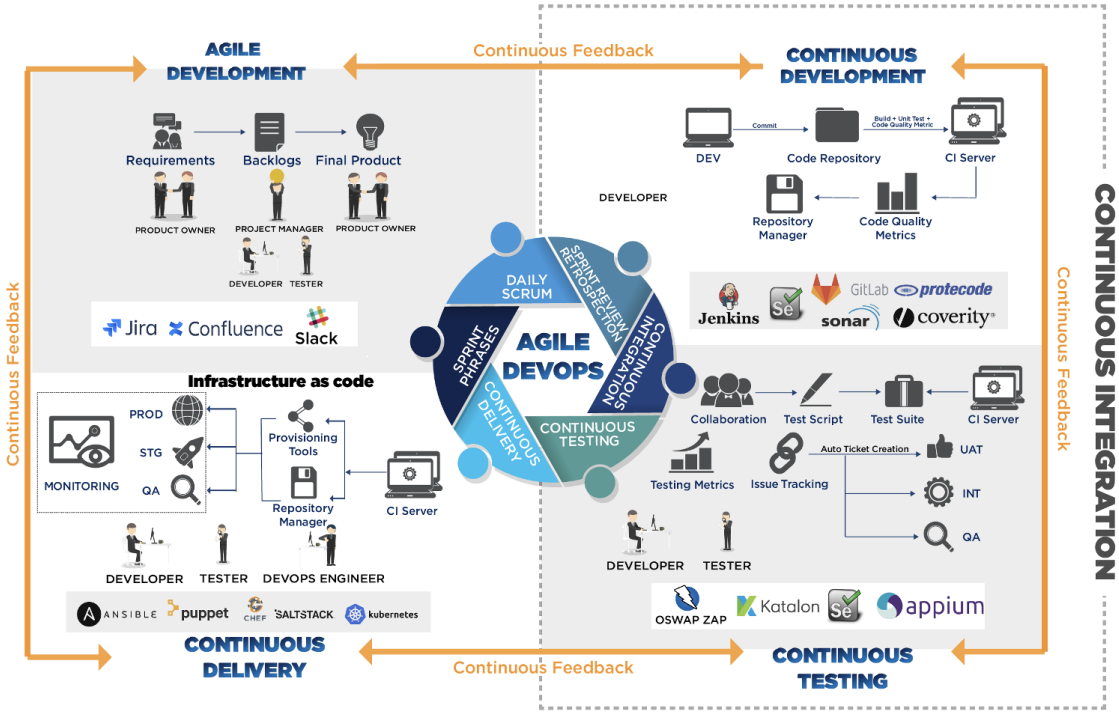
CICD Sample System On AWS



1. Developers continually integrate their changes together into a main branch hosted within a source code repository system such as GitHub.
2. AWS CodePipeline polls the source code repository and triggers an execution of the continuously delivery pipeline when a new revision is found.
3. AWS CodePIpeline sends the new revision to AWS CodeBuild which builds a Docker container image from the source code.
4. AWS CodeBuild pushes the newly built Docker container image tagged with the build ID to an Amazon ECR repository.
5. AWS CodePipeline initiates an update of the AWS CloudFormation stack which defines the Amazon ECS task definition and service.
6. AWS CloudFormation creates a new task definition revision referencing the newly built image and updates the Amazon ECS service.
7. Amazon ECS fetches the new container from Amazon ECR and replaces the old task with the new one which completes the deployment.

amazon web services

Agile DevOps



OVERALL

The standard process handbook built by DevOps team based on both numerous practical experiences from working multiple types of FSOFT projects and DevOps implementation.

OBJECTIVE

- Standard the software developing process at FSOFT into a determined and unified
- Measure KPIs more conscientiously and convincingly.
- Increase productivity and work efficiency, save efforts and resources while improve customer satisfaction and employee professionalism.

WHAT'S NEXT?

- Continue to support more projects
- Concentrate and accomplish specific use-case for each domain.

Thank You