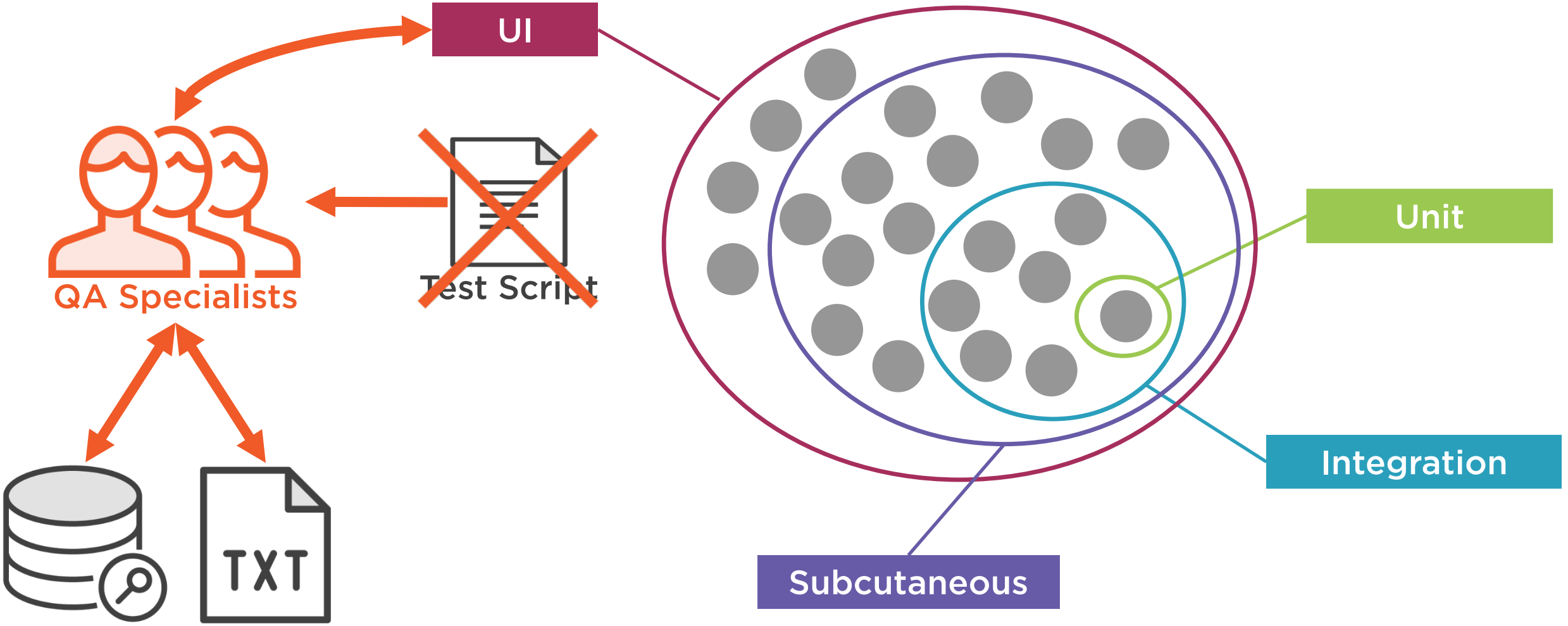
Automated Testing Within the Software Development Process

Overview

- Complimenting automated testing with manual testers
- Exploratory testing
- Getting QA specialists involved
- Running tests as part of continuous integration
- The role of automated tests in continuous delivery
- An overview of Test Driven Development
- Advanced testing tools and techniques
- Further learning and next steps

Automated tests generally don’t replace all manual testing.

Complimenting Automated Testing with Manual Testers

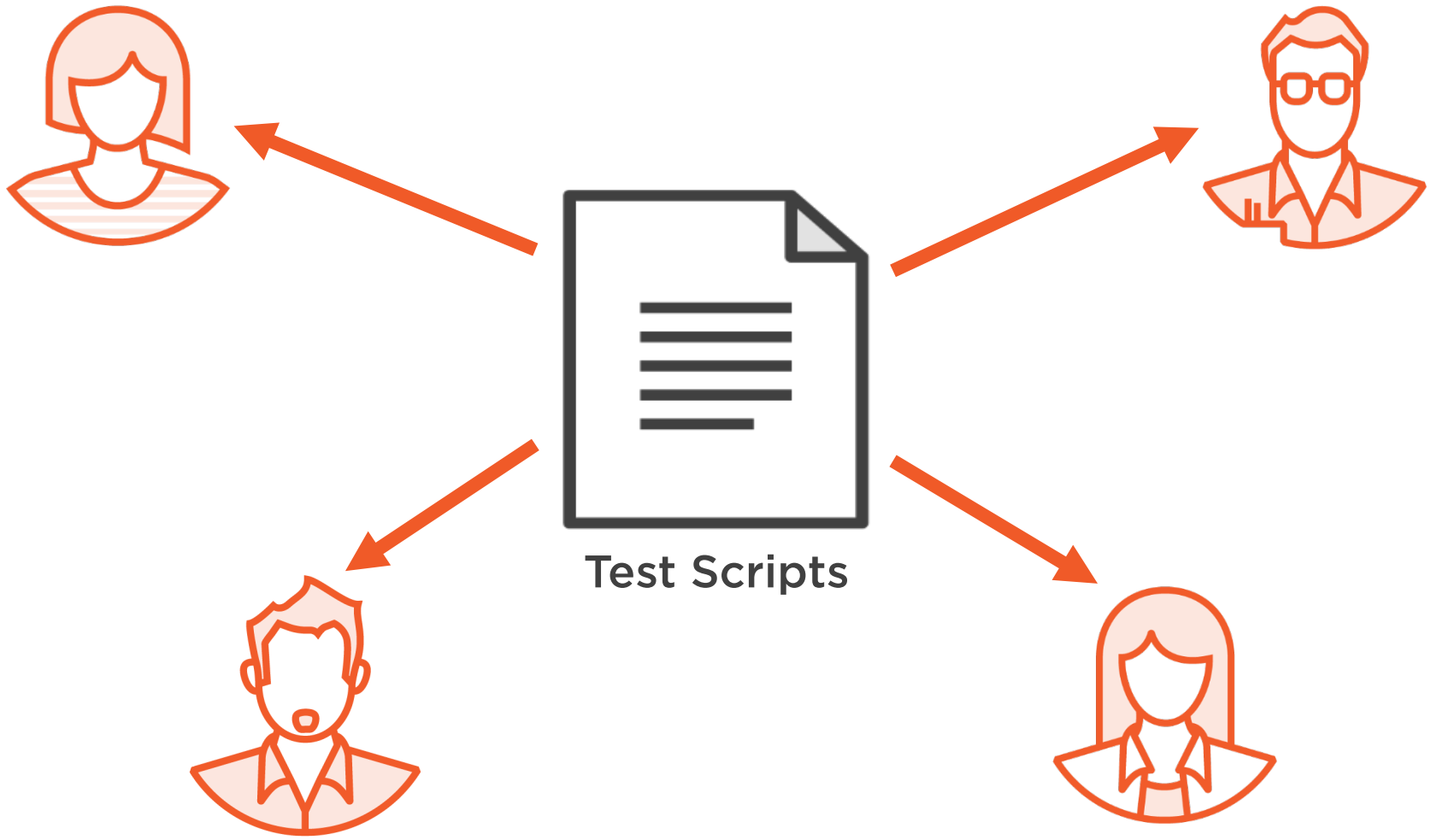


Exploratory testing is...a “practice” a style or approach to testing software which is often contrasted to “scripted testing”...

Agile Alliance

https://www.agilealliance.org/glossary/exploratory-testing/

Scripted Testing



Exploratory Testing

Less up-front work required
Intellectually stimulating
Ideas for future features

Disciplined
Not "random"
Freedom and accountability

Explore & investigate
Understand & learn about the product
Different or weird use cases
Report missing requirements or probable bugs
Look for predictable & unpredictable outcomes
Past experience guides future testing (rather than rigid test script)

When a bug is found, a failing automated test can be written to reproduce it.

When the bug is fixed the test will now pass.

In some future change, if the bug reoccurs it will be caught by the automated test.

Getting QA Specialists Involved

Assist with requirements analysis / discussions.

Help identify missing requirements or potential testing difficulties.

Assist business analysts.

Help define acceptance criteria for a feature.

Pair with developers when writing automated tests.

Help identify missing tests / test case data.

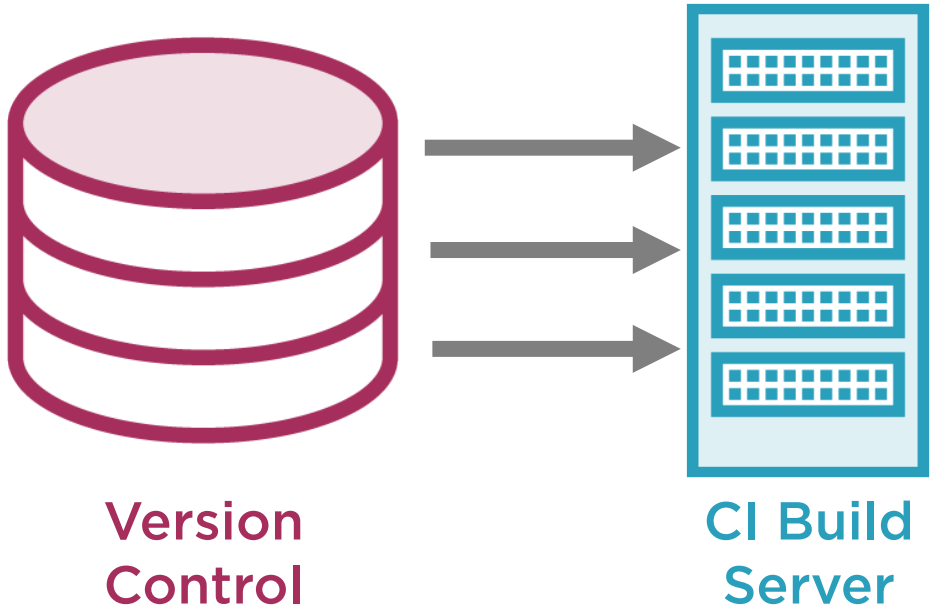
Running Tests as Part of Continuous Integration

"Continuous Integration is a software development practice where members of a team integrate their work frequently, usually each person integrates at least daily - leading to multiple integrations per day. Each integration is verified by an automated build (including test) to detect integration errors as quickly as possible"

Marten Fowler

https://martinfowler.com/articles/continuousIntegration.html

Running Tests as Part of Continuous Integration

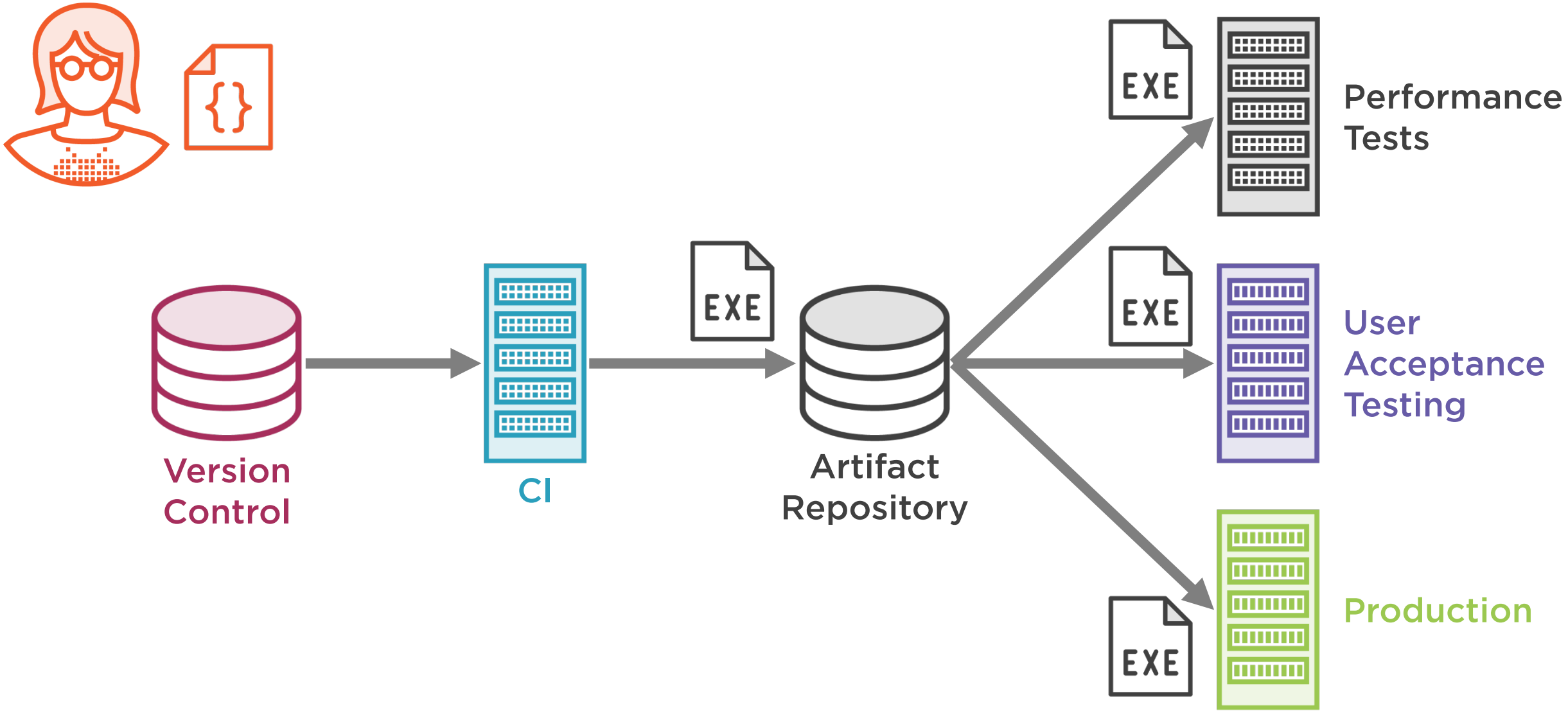


Get latest changes
Build code
Run unit tests
Run integration tests
Run subcutaneous tests
Deploy to web server
Run UI tests
Report results

Continuous Delivery

A practice that allows smaller changes to be deployed to production more frequently, in an automated and predictable fashion, to deliver value more often and decrease time to market for new features.

Continuous Delivery Deployment Pipeline

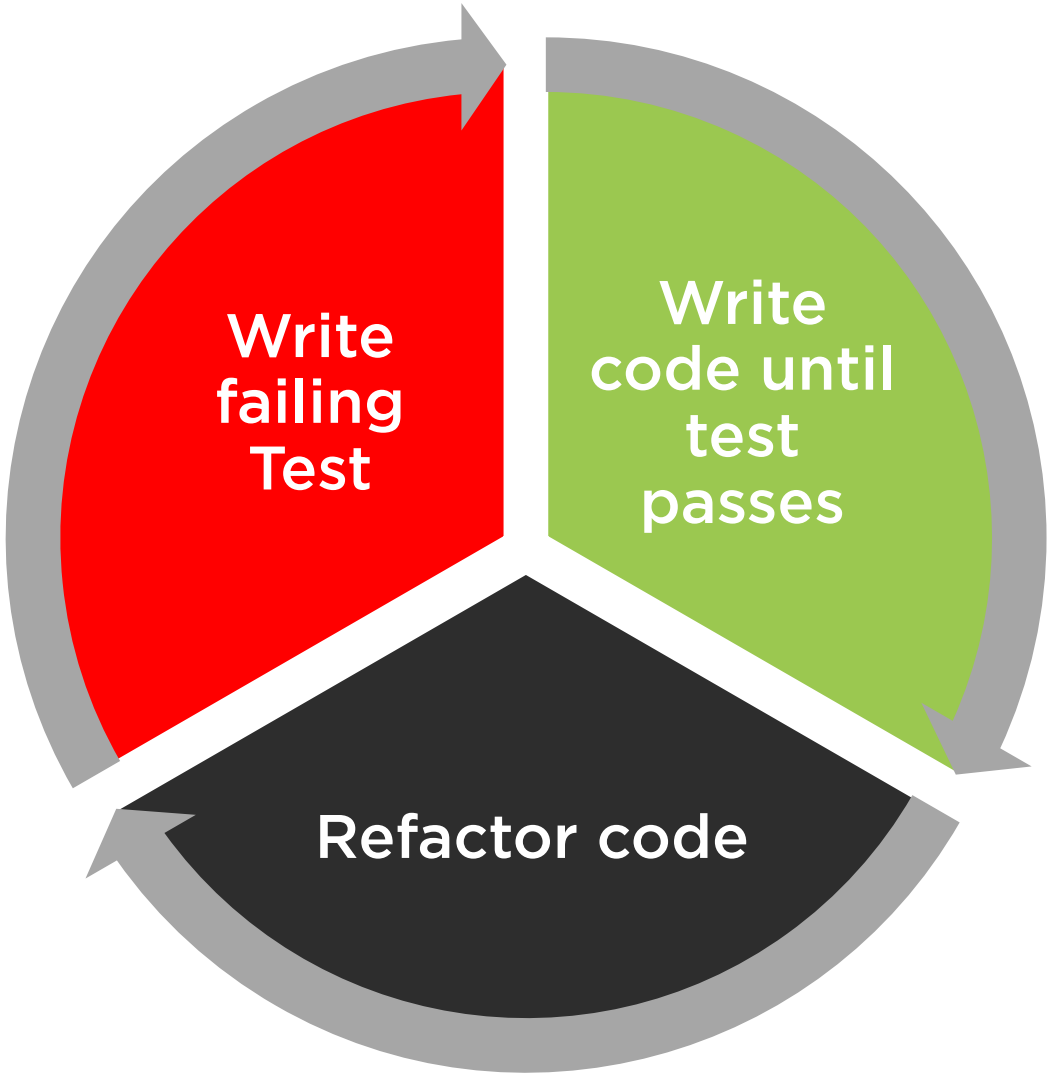


“Test-Driven Development (TDD) is a technique for building software that guides software development by writing tests.”

Martin Fowler

https://martinfowler.com/bliki/TestDrivenDevelopment.html

An Overview of Test Driven Development



Pros:

Helps think about problem / requirement
Can help produce better code designs
Can provide good work “rhythm” / flow
Automated test suite byproduct
Tests help document system

Cons:

Skill that needs learning through practice
Refactor stage sometimes neglected
May result in “over-testing”
Over reliance on mocks (unit size)

Advanced Testing Tools and Techniques

Auto data tools

(e.g. AutoFixture for .NET)

Approval Tests

(Java, .NET, etc.)

Live testing

(e.g. VS 2017)

Code coverage

Summary

Complimenting automated testing with manual testers

Exploratory testing

Getting QA specialists involved

- Requirements analysis / discussions
- Help define acceptance criteria
- Pair with developers

Running tests as part of continuous integration

The role of automated tests in continuous delivery

An overview of Test Driven Development

Advanced testing tools and techniques

Further Learning and Next Steps

- Continuous Integration and Continuous Delivery: The Big Picture (Barry Luijbregts)
- Test-driven Development: The Big Picture (Jason Olson)
- Introduction to Testing in Java (Richard Warburton)
- Testing .NET Code with xUnit.net 2 (Jason Roberts)
- ASP.NET Core MVC Testing Fundamentals (Jason Roberts)
- Better .NET Unit Tests with AutoFixture: Get Started, Approval Tests for .NET (Jason Roberts)