Behavior-Driven Development (BDD) Testing with Appium and SpecFlow

Introducing BDD

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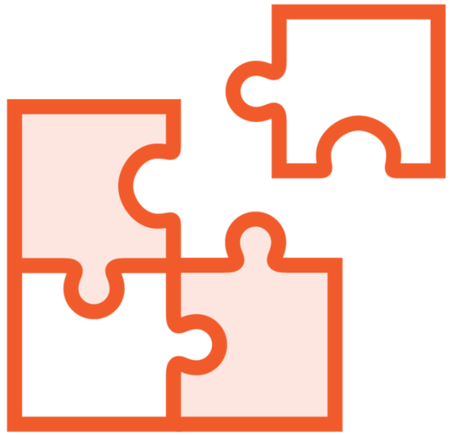
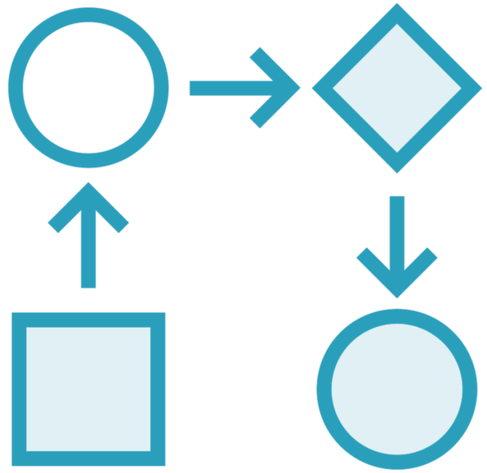
Course Overview

- Learn how to do behavior-driven development properly
- Set up a development environment
- Formulate and automate scenarios using SpecFlow and Appium
- Learn how to combine and use these two frameworks together
- Create living documentation
- Explore the most commonly used features of SpecFlow

Main Takeaways



Recognize how BDD fits in your processes



Learn how to write E2E automated tests using C#, SpecFlow, and Appium

Knowledge of Appium is recommended but not obligatory.

If you want to learn Appium in-depth, refer to other courses from this path.

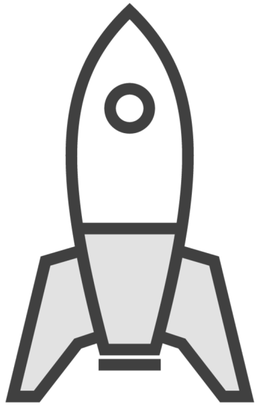
What Is BDD?

What Is BDD?

Test automation using
`Given, When, Then`

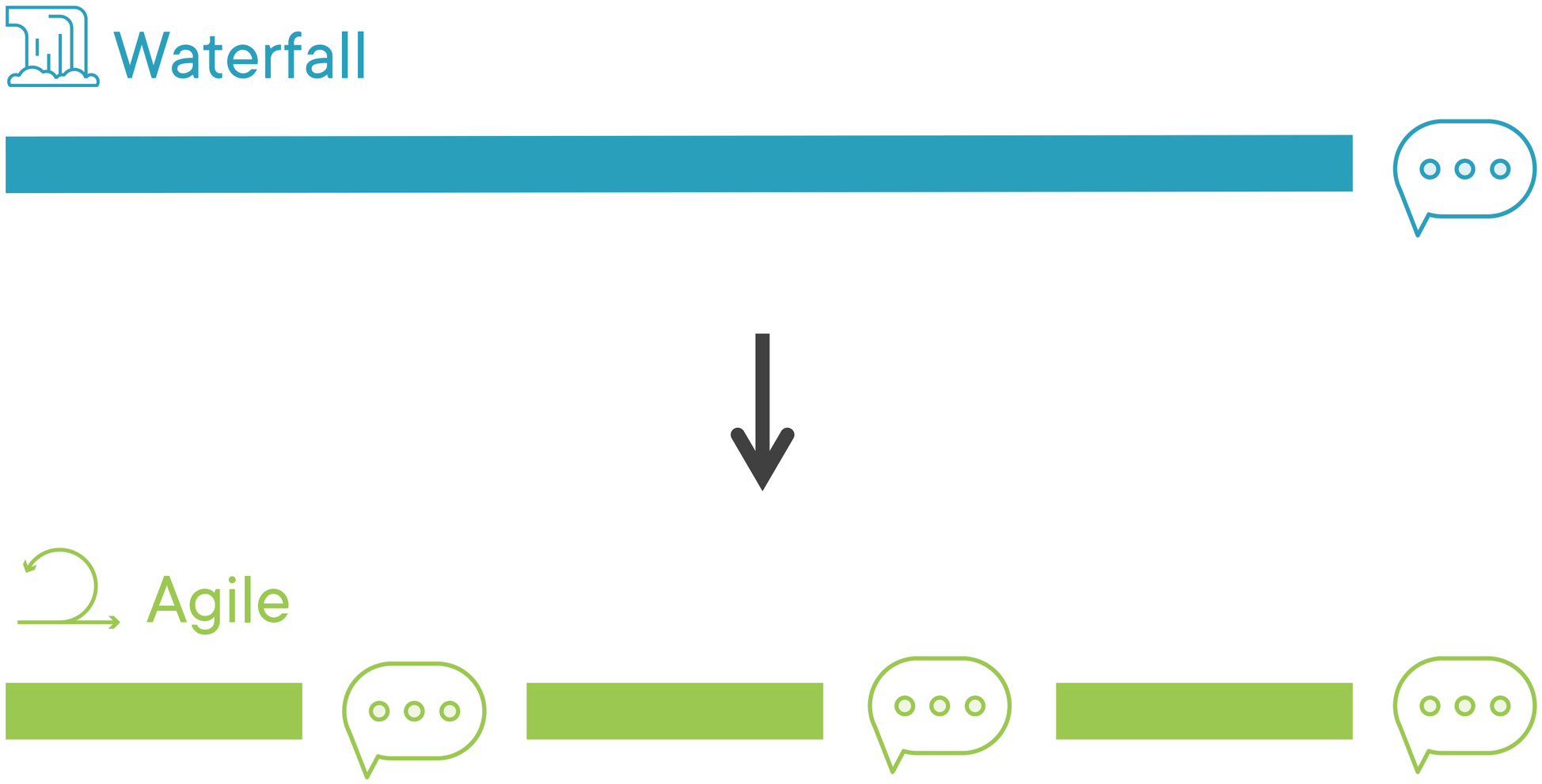
Collaborative activity focused on gaining shared understanding and removing communication gaps

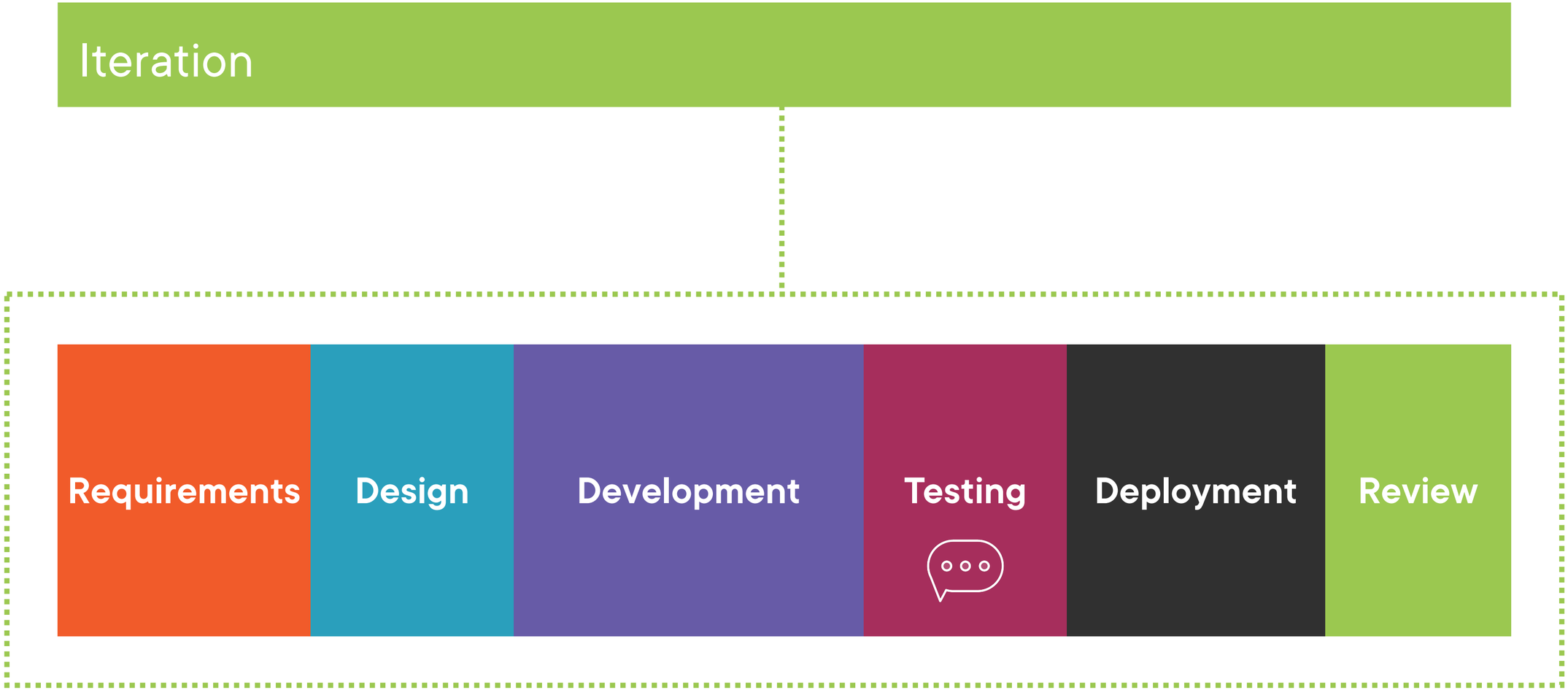
Requirements



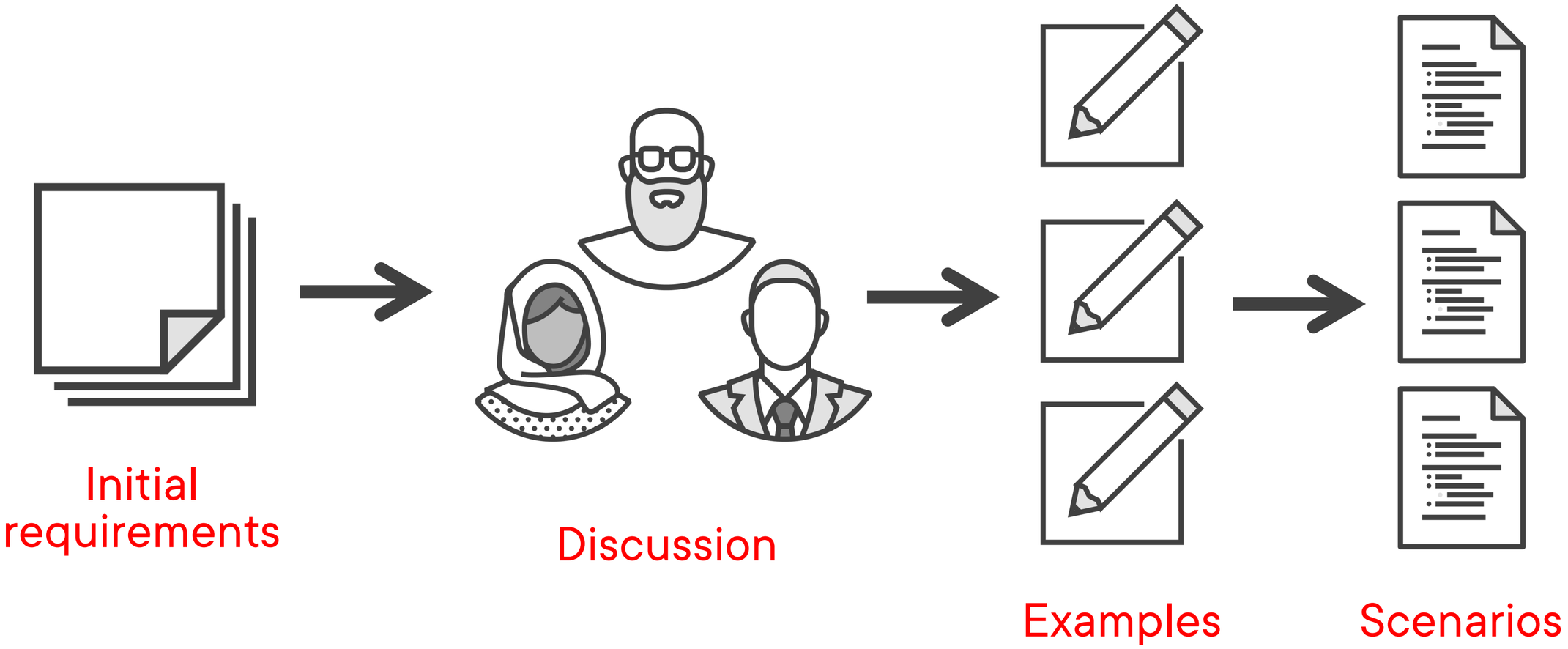
Software

Communication gaps exist
because we don't share the
same understanding.


Waterfall
Agile


Iteration
Requirements
Design
Development
Testing
Deployment
Review

The BDD Process



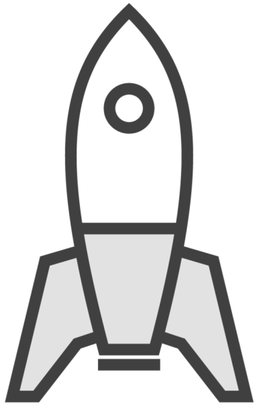
BDD Scenarios

As documentation, they represent a shared understanding of all parties

As tests, they show that a feature meets business requirements and acts as a safety mechanism against undesired changes

They act as living documentation, which demonstrates the actual functionality of the software

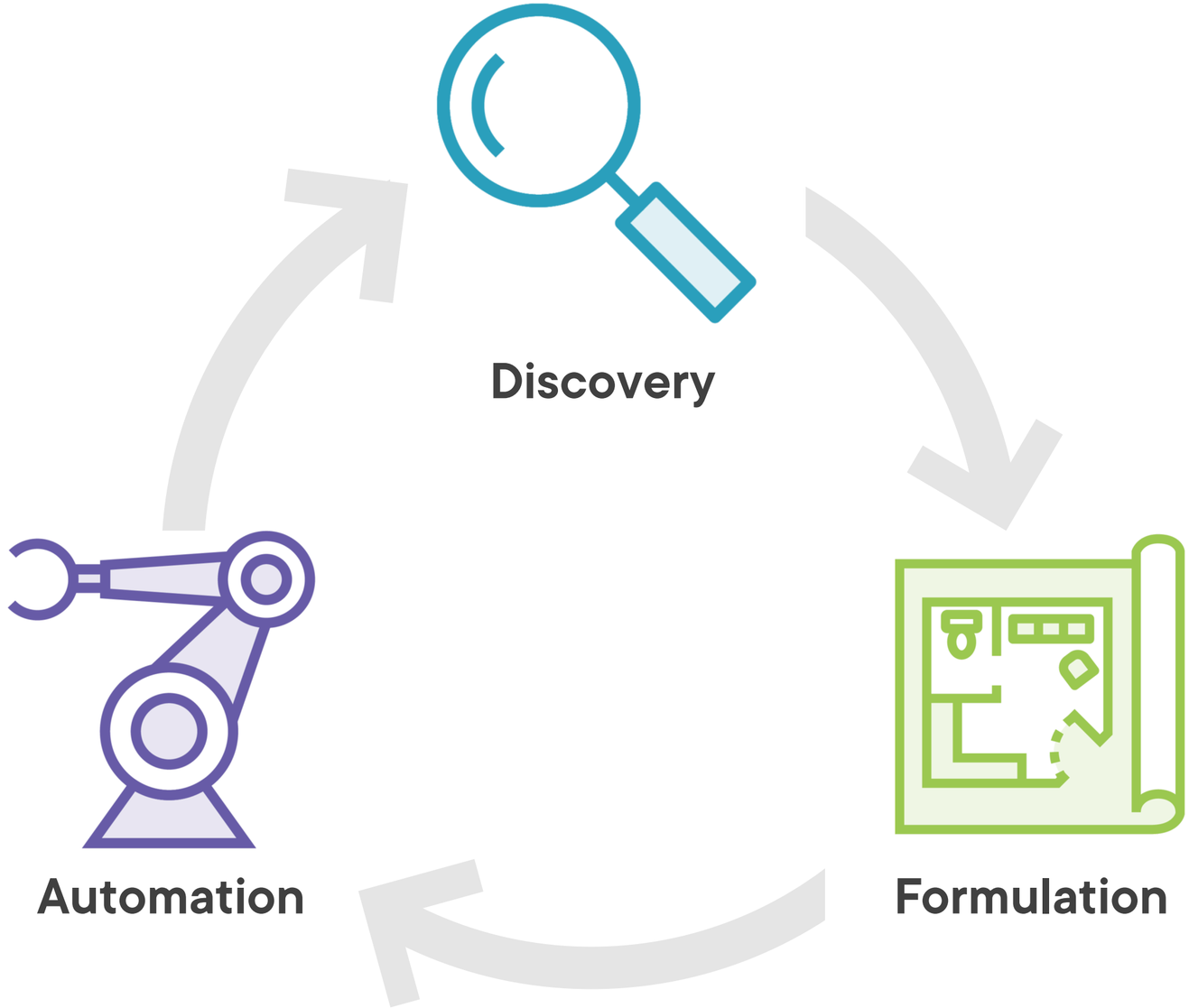
Requirements



Product

Exploring Phases of BDD

Phases of BDD



Discovery

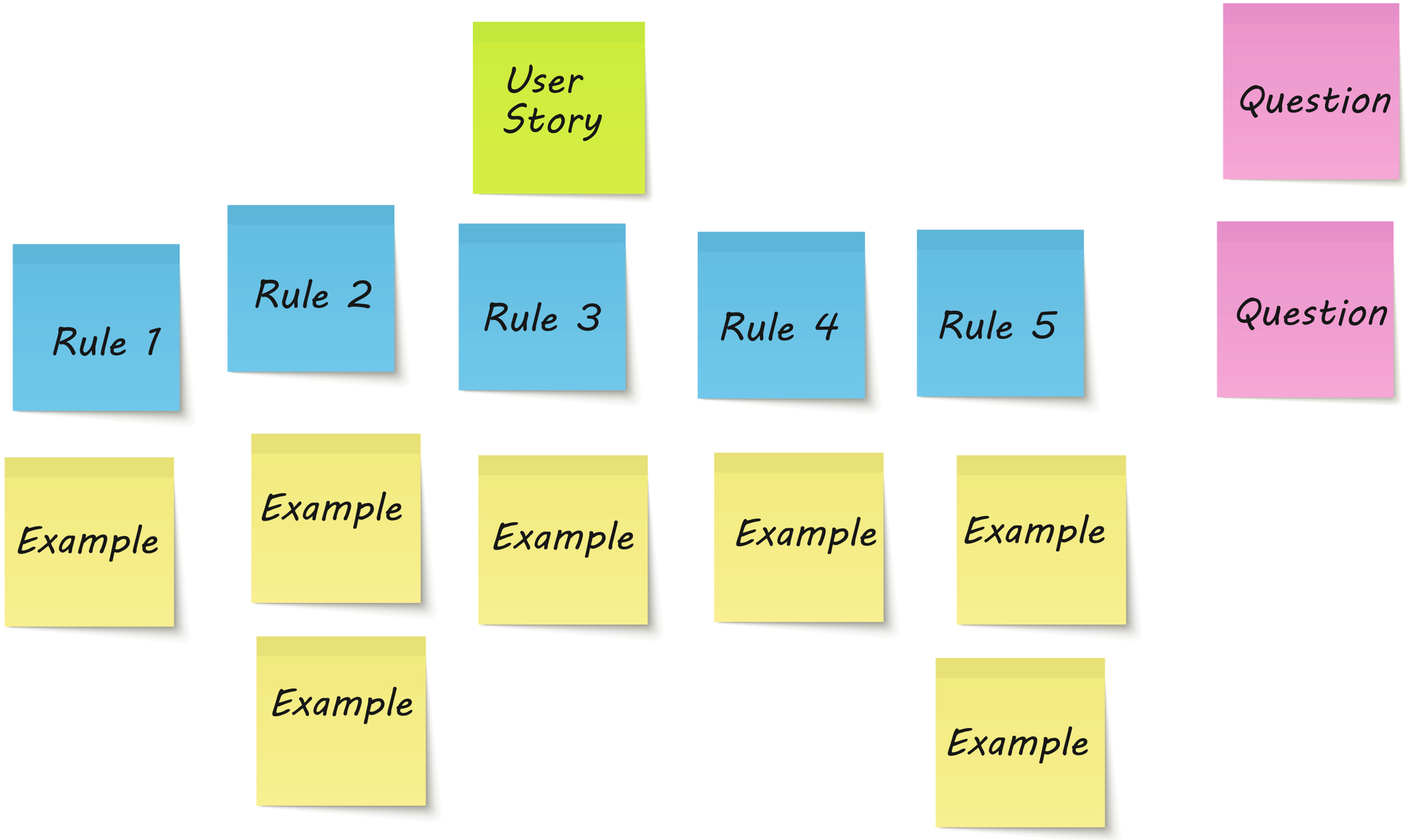
Requires initial requirements to be present

Requires all team members with different technical backgrounds and a business representative

The goal is to generate just enough examples to describe the behavior of a system

Example mapping can be used to structure and ease this process

Example Mapping



Formulation

Examples are formulated into business-readable scenarios

Requires using common and unambiguous language

Requires a specific format

Robot Framework

```
*** Test Cases ***
Login with unknown e-mail
Open Home Page
Check Title
Enter E-mail
Enter Password
Click Login
sleep ${Delay}
Assert Warning Message
[Teardown] Close Browser
…
```

Gherkin

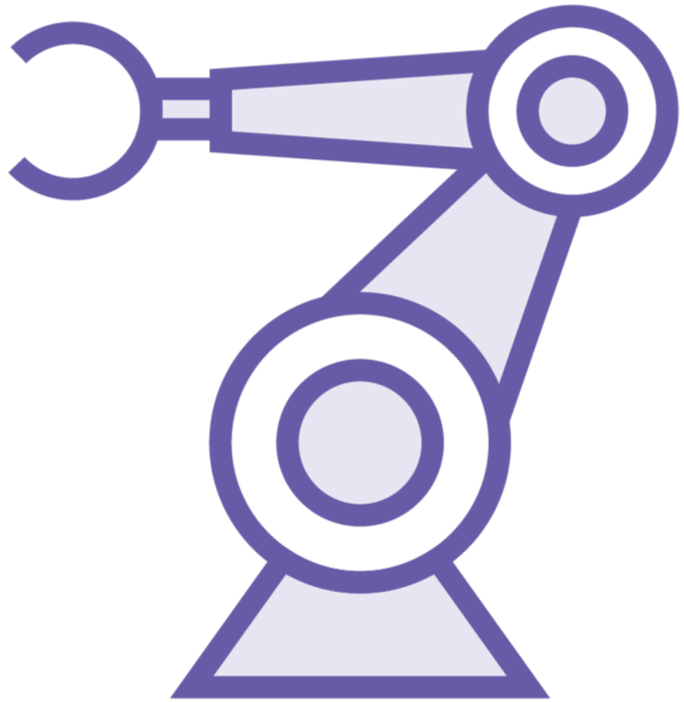
```
Background:
Given I have overdue tasks

Scenario: First use of the day
Given I used the app yesterday
When I use the app
Then I am notified about overdue tasks
```

FitNesse

```
!2 Story: the amount you pay determines the
discount.
!|discount for payment|
 | payment | discount |
 |   0.2   |    1     |
 |   1     |    4     |
 |   5     |    20    |
```

Automation



Formulated scenarios are automated using a test automation tool or framework

Automating scenarios creates living documentation

Discovery Phase

Eleven
Product Owner

Lucas
Software Developer

Mike
Software Developer

Dustin
QA

Nancy
UX Designer

Eleven

Lucas

Allow users to reserve a group training class

Mike

Dustin

Nancy

Add a new page for training reservations

The training reservations page should contain a calendar that shows the training schedule for the current week

When a user selects the desired class, a pop-up window should appear with the number of available spots and a button to reserve the class

Clicking on the reserve button should reserve the spot
The maximum number of spots per group training class is 10

Users can reserve a spot up to 30 minutes before the training starts

If the class is fully booked, users can sign up to a waiting list, and if someone cancels the appointment, the first user from the waiting list will be automatically added to the class

Eleven

Lucas

Allow users to reserve a group training class

Mike

Dustin

Nancy

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Can we hide a number of available spots?

- Peter, is on the reservations page
- Peter selects the desired class and clicks on the reserve button
- If there are free spots, the class will be reserved

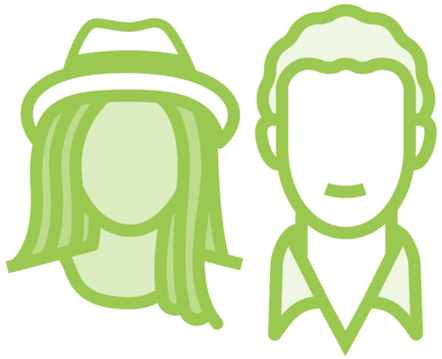
- Peter and Jane are on the reservations page
- They both try to reserve the same class at the same time
- Only one of them will get a reservation, while the other will get a validation message

- Jane is on the reservation page
- Jane has selected a class that begins in 35 minutes and has the reserve button visible
- She waits for 10 minutes and hits "Reserve"
- A validation message appears

Formulation Phase

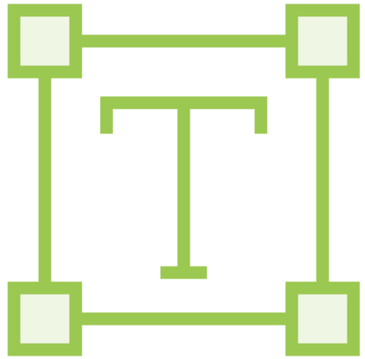
Formulation

Process of turning a shared understanding of how a system should behave into a business readable specification.



Collaboration

To ensure that the language used in scenarios will convey the same meaning to all parties



Supported format

That is understood by a test automation software

Gherkin

Syntax designed to be a non-technical and human-readable way of describing use cases in software.

```
Feature: Calculator
Calculator for adding two numbers

Scenario: Add two numbers
Add two numbers with the calculator

Given I have entered 10 into the calculator
And I have entered 5 into the calculator
When I press add
Then the result on the screen should be 15
```

- Peter, is on the reservations page
- Peter selects the desired class and clicks on the reserve button
- If there are free spots, the class will be reserved

Feature: Class reservation

Scenario: User reserves a spot

Given Peter is on the reservation page

And there are 3 spots available for the Cycling group training

When when Peter selects the Cycling group training

And selects the reserve button

Then the class will be reserved

Personas are fictional characters which you create based upon your research to represent the different user types that might use your product.

Why Should You Use Personas?

Understand your users' needs, experiences, behaviors, and goals

Recognize different people have different needs and expectations

Ask the right questions and answer those questions in line with the users you are designing for

Get the most value when designing and discussing the behavior of your system

Automation Phase

Automation

Scenario

Executable specification

```
[Given("Peter is on the reservation page")]
public void GivenPeterIsOnTheReservationPage()
{
        // Implementation Code
}
```

```
…
Given Peter is on the reservation page
…
When Peter selects the reserve button
…
```

```
[When("Peter selects the reserve button")]
public void WhenPeterSelectsTheReserveButton()
{
        // Implementation Code
}
```

Each feature is treated as a separate testing suite, while each scenario represents an individual test.

```
[Given("Peter is on the reservation page")]
public void GivenPeterIsOnTheReservationPage()
{
        ScenarioContext.Current.Pending()
}
```

…

```
Given Peter is on the reservation page
And there are 3 spots available for the Cycling group training
When Peter selects the Cycling group training
And selects the reserve button
Then the class will be reserved
```

Module Summary

Module Summary

BDD is a collaborative activity with the primary purpose of gaining a shared understanding

The BDD process consists of three phases: Discovery, Formulation, and Automation

Discovery is all about understanding requirements through collaborative identification of examples

Formulated scenarios should be structured and should follow a syntax understood by automation tools

Automated scenarios represent a living documentation

Up Next:
Getting Started with Appium and SpecFlow