Implementing a Test Automation UFT Framework in a DevOps World
January 30, 2018

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Today's Speaker

Bob Crews
Vivit Florida User Group Leader
President
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Ask

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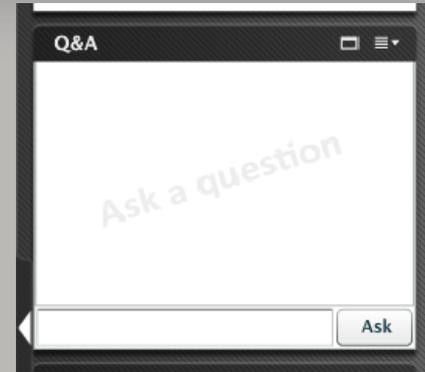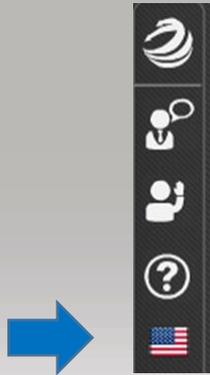
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Implementing a Reliable UFT Framework

In a DevOps World

About Bob Crews

- President/Co-founder of Checkpoint Technologies
- Co-Leader Vivit Florida Chapter
- President of TBQAA (Tampa Bay Quality Assurance Association)
- CSTE/CAST Instructor
- 29 years IT experience
- 19 with focus on QA and QC
  - Risk Analysis
  - Test Automation
  - Effective Test Planning & Test Case Design
  - Internet of Things
  - **Agile & DevOps**

Which direction will the bus move once the bus starts moving forward?

A

B
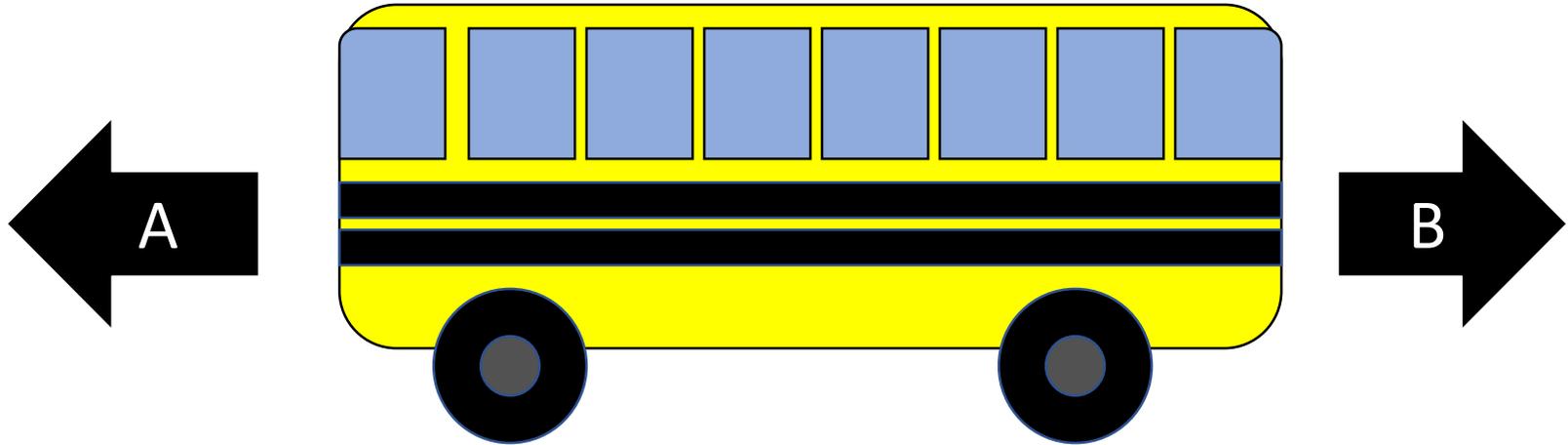
Learning Objectives

- Necessity/value of test automation in DevOps

- Elements of a successful automation framework

- Value of an automation framework

- Practical tips to design and implement an automation framework in DevOps

Why DevOps?

Definition, Goals, and Differences

Continuous Integration, Continuous Delivery, Continuous Deployment

Continuous Integration

Build → Test → Deploy - Stage → Accept. Test → Deploy - Prod → Smoke Test

Continuous Delivery

Build → Test → Deploy - Stage → Accept. Test → Deploy - Prod → Smoke Test

Continuous Deployment

■ = Automated   ■ = Manual
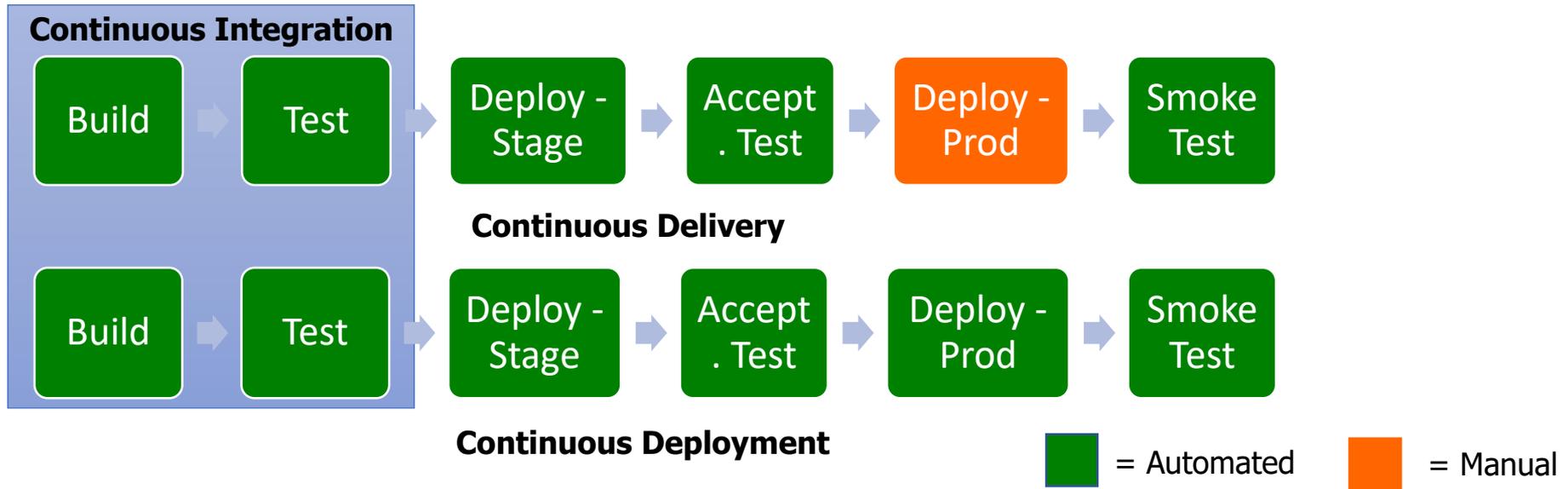
Let's Focus On Automated Testing

Build → **Test** → Deploy - Stage → **Accept. Test** → Deploy - Prod → **Smoke Test**
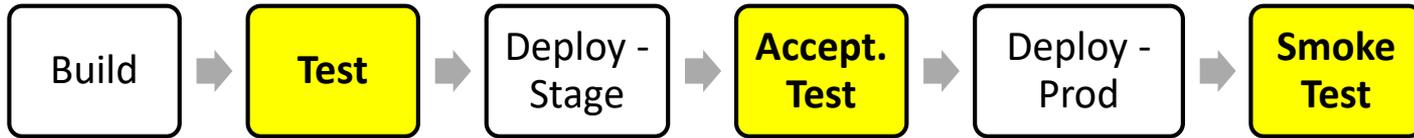
Understand how the scope of testing changes with DevOps.

Testing Scope Change

With each occurrence it's…

Traditional

Testing less often and validating more revisions

vs

DevOps

Testing more frequently to validate fewer revisions

How? Test automation and…

A Well-Designed Framework

➢ *Decreases* automated test development time

➢ Enables tests to be created *sooner*

➢ *Decreases* maintenance

➢ *Increases* test automation coverage

➢ Puts the power of automation in *more hands*

Fundamentals of a Successful UFT Framework

Definition, Goals, Characteristics & Common Elements

Automation Framework Definition

➢ A test automation methodology that *separates* the automation code from the data

➢ Allows for separate development and maintenance of the two assets

Automation Framework Characteristics

➤ Modular code

➤ Scalable

➤ Error handling

➤ Reliable

➤ Data separated from code
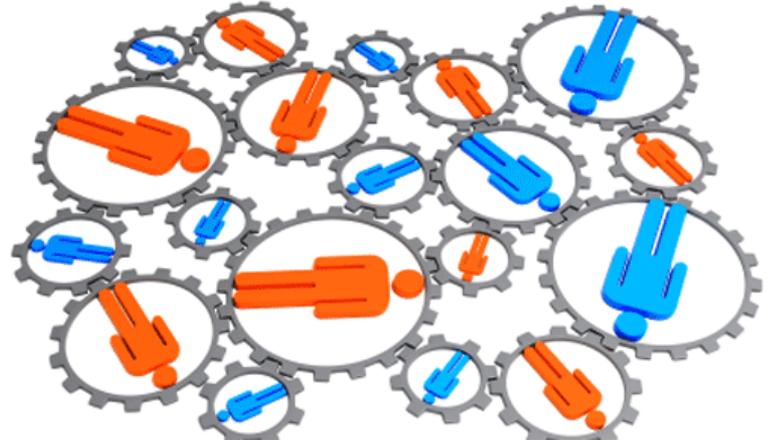
Common Elements of Successful Frameworks

1. Simple front-end

2. Maintainable back-end

    A. Master Driver

    B. Application Driver

    C. Business Process Driver

3. Data

UserName	PassWord	Exp_Results
pmccart	Hey*jude	Success
jlenno	Imagine!	Fail
gharri	Wmggw#	Fail

Master Driver → Application Driver → Business Process Driver / Business Process Driver
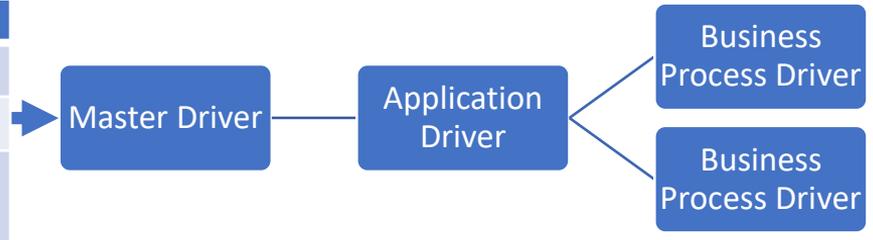
Simple Front-End

➢Mechanism for creating the test scripts

➢Each column is granular step or action

➢Each record is one iteration of test

UserName	PassWord	Exp_Results

Master Driver → Application Driver → Business Process Driver / Business Process Driver

Robust Back-End

UserName	PassWord	Exp_Results

Master Driver — Application Driver — Business Process Driver / Business Process Driver
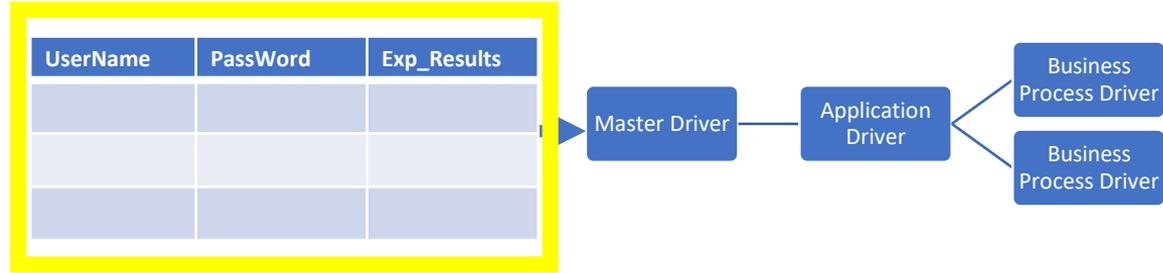
➢**C**ode that…
- reads the data
- executes the test and
- handles everything possible

…to ensure the most successful test run

➢<u>Must</u> be scalable and maintainable

Back-End Drivers

➢ Master Driver Script
  ➢ Copies the Input File to the Execution folder
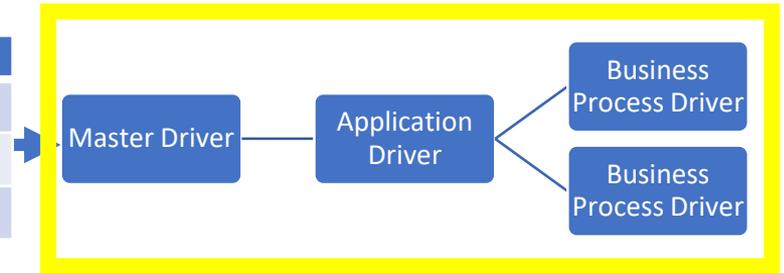 ➢ For each row of data, each sheet is evaluated whether or not there is data in the current row.
  ➢ Reads the sheet name and calls the appropriate Application Driver

➢ Application Driver
  ➢ The Application Driver calls the automated business process related to the name of the current sheet

➢ Business Processes Driver
  ➢ Each step is evaluated for execution based on the data
  ➢ Report steps are written to the test results

Data

➢ The framework must be driven by DATA!

➢ Data can be in the form of input data and/or keywords

➢ Must allow for multiple data iterations

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gharri	Wmggw#	Fail

UFT Automation Framework

Description & Design Process

Framework Features

➢ Key-word & data-driven based on the AUT business processes (*Key-words*) and parameters (*Data*)

➢ Parameter Types:

  ➢ Input – Data entered into edit fields, drop-down lists, etc.

  ➢ Verification – Expected values compared to actual results

  ➢ Decision/Action – Creates an action against an object

  ➢ Output parameter – Place holders for data captured from the AUT during execution

➢ Low-level common functions

➢ Reporting

Front-End Description

➢Front-end utilizes Excel for script design

- ➢ Each column represents a test step
- ➢ Each tab represents a Business Process
- ➢ Each BP tab contains all the necessary parameters to create both positive and negative test scenarios
- ➢ Output is captured to Output Parameters and can be used in subsequent iterations by using an Excel formula

➢Multiple AUTs can be incorporated into integration test by adding tabs associated with other AUTs

Front-End Description (con't)

➢ A Master Excel Template contains all the business process for a given application.

	N	O	P	Q	R	S	T	U
1	Second_Answer	Agree_To_Terms_Of_Use_Checkbox	Click_Register_Button	Click_Change_link	Zipcode_change	Click_Change_Go_Button	Expected_Changed_Location	Expected_Messages
2								
3								
4								

Test Summary | AUT Login | **AUT Registration** | AUT Manage Profile | AUT Manage Equipment | AUT Call Forwarding | AUT Call Blocking | AUT Voice Mail Settings

Step	Action	Exp_Result
14	Enter <second answer> to pass code word	
15	Check Agree to Terms	
16	Click Register button	Registration
17	Click "Close" button	Confirmation window closes
18	Click Manage Profile menu item	Manage Profile window appears
19	Enter "Florida" for preferred state	Manage profile
20	Check "Send emails weekly"	

Back-End Description - Drivers

➤ **Master driver script** controls the flow of the script based on the data.

➤ Calls **Application driver scripts** which in turn calls **Business Process drivers** - specific groups of steps (actions) that contain all the steps required to complete **ALL** of the business process (BP) needs both positive and negative

```
'Evaluate if the current sheet (action). If data exists in the current iteration the sub-driver will be called
If ExecuteAction(LocalActionExcelObject,objActionWorkSheet,Environment("IterationRow")) Then
    'Call the application specific parent action based on the current sheet name prefix
    Select Case Ucase(sheetNamePrefix)
        Case "MS"
            RunAction "My Services Driver [My Services Driver Script]", oneIteration
        Case "ATIM"
            RunAction "ATIM Driver Script Action [ATIM Driver Script]", oneIteration
        Case "CRM"
            RunAction "CRM Driver Script Action [CRM Driver Script]", oneIteration
        Case Else
            Reporter.ReportEvent micFail,"Process " & sheetName & " is not yet accounted...
    End Select
End If 'End If ExecuteAction(LocalActionExc
```

Back-End Description - Actions

➤ Code (in the form of <u>actions)</u> are mostly devoid of logic and contain simple steps referencing the object with the related parameterized data

```
Browser("Networks").Page("Networks").WebElement("Register for a My Services").VerifyExist "Register Page"

Browser("Networks").Page("Networks").WebEdit("Email Address").Set Parameter("Email_Address")
Browser("Networks").Page("Networks").WebEdit("Re-Enter Email Address").Set Parameter("ReEnter_Email_Address")
Browser("Networks").Page("Networks").WebEdit("Account Number").Set Parameter("Account_Number")
Browser("Networks").Page("Networks").WebEdit("Customer Code").Set Parameter("Customer_Code")
Browser("Networks").Page("Networks").WebEdit("Username").Set Parameter("Username")
Browser("Networks").Page("Networks").WebEdit("Choose Password").Set Parameter("Choose_Password")
Browser("Networks").Page("Networks").WebEdit("Question 1").Set Parameter("First_Security_Question")
Browser("Networks").Page("Networks").WebEdit("Your Answer 1").Set Parameter("First_Answer")
Browser("Networks").Page("Networks").WebEdit("Your Answer 2").Set Parameter("Second_Answer")
Browser("Networks").Page("Networks").WebCheckBox("Iagree").Set Parameter("Agree_To_Terms_Checkbox")
Browser("Networks").Page("Networks").Link("Register").Click Parameter("Click_Register_Button")

Browser("Bright House Networks").Page("Bright House Networks").VerifyMessages Parameter("Expected_Messages")

Browser("Bright House Networks").Page("Bright House Networks").ClickLinkOnPage Parameter("Link_To_Click")
```
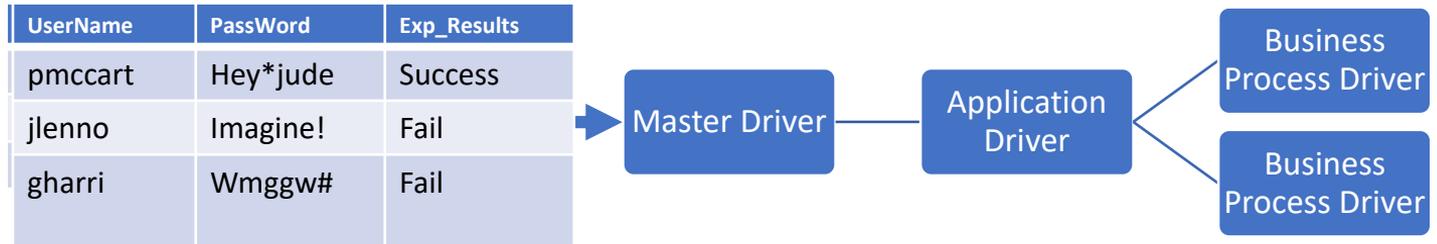
Framework Design

1. Front-end & Data

2. Back-end (Drivers)
   a) Master Driver Script
   b) Application Driver
   c) Business Process Drivers

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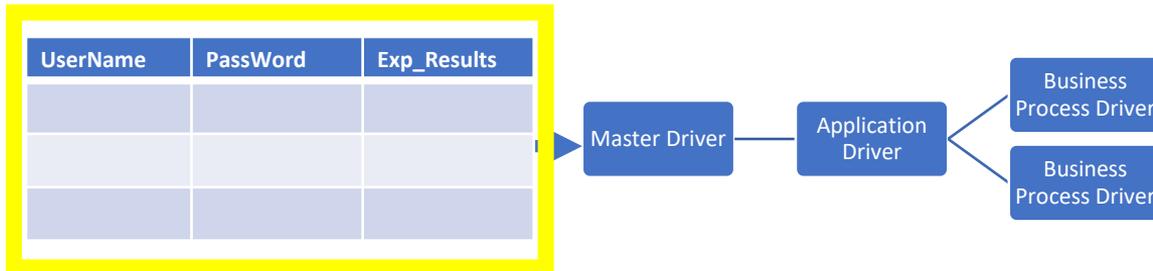
Front-End & Data Design

➢ Design front-end prior to back-end
  ➢ Who will be tasked with using the framework to design the automated tests?
  ➢ In what format will the tests be designed?
  ➢ What tool will manage the data? (Excel, DB, XML, etc.)
  ➢ Utilize Input, Output, Decision and Verification parameters
  ➢ What is the syntax/rules governing the data input?
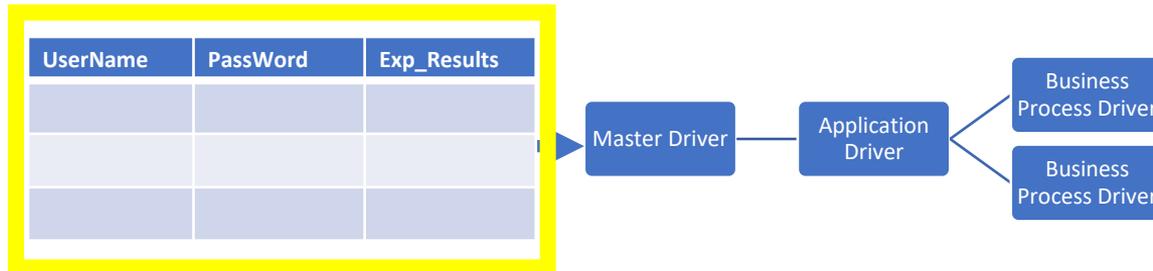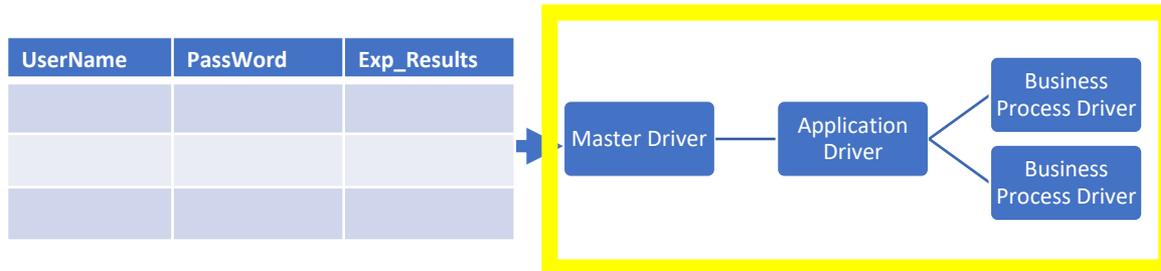
Front-End Design Tips

➢Tips & Tricks
- ➢Know your users
- ➢Use common tool for data input
- ➢Document and communicate standard
- ➢Incorporate simple keywords

UserName	PassWord	Exp_Results

Master Driver → Application Driver → Business Process Driver / Business Process Driver

Back-End Design

➤Build the back-end to support the front-end
  ➤ How does the data get fed into the framework?
  ➤ How does runtime data get captured and reused?
  ➤ How are multiple iterations handled?
  ➤ What type and level of reporting is created – tool generated and/or custom? (screenshots)
 ➤ How are unexpected events handled?

UserName	PassWord	Exp_Results

Back-End Design Tips

➤ The code must be:
- ➤ Modular in design
- ➤ Well documented/commented
- ➤ Reporting needs to be detailed, clear & concise
- ➤ Simple enough so that a master's degree in software development is not required for maintenance and support

➤ Multiple applications and platforms need to be taken into consideration

➤ Know the scope and expectations of automation within your organization

Applying Your Framework

For DevOps or Continuous Integration
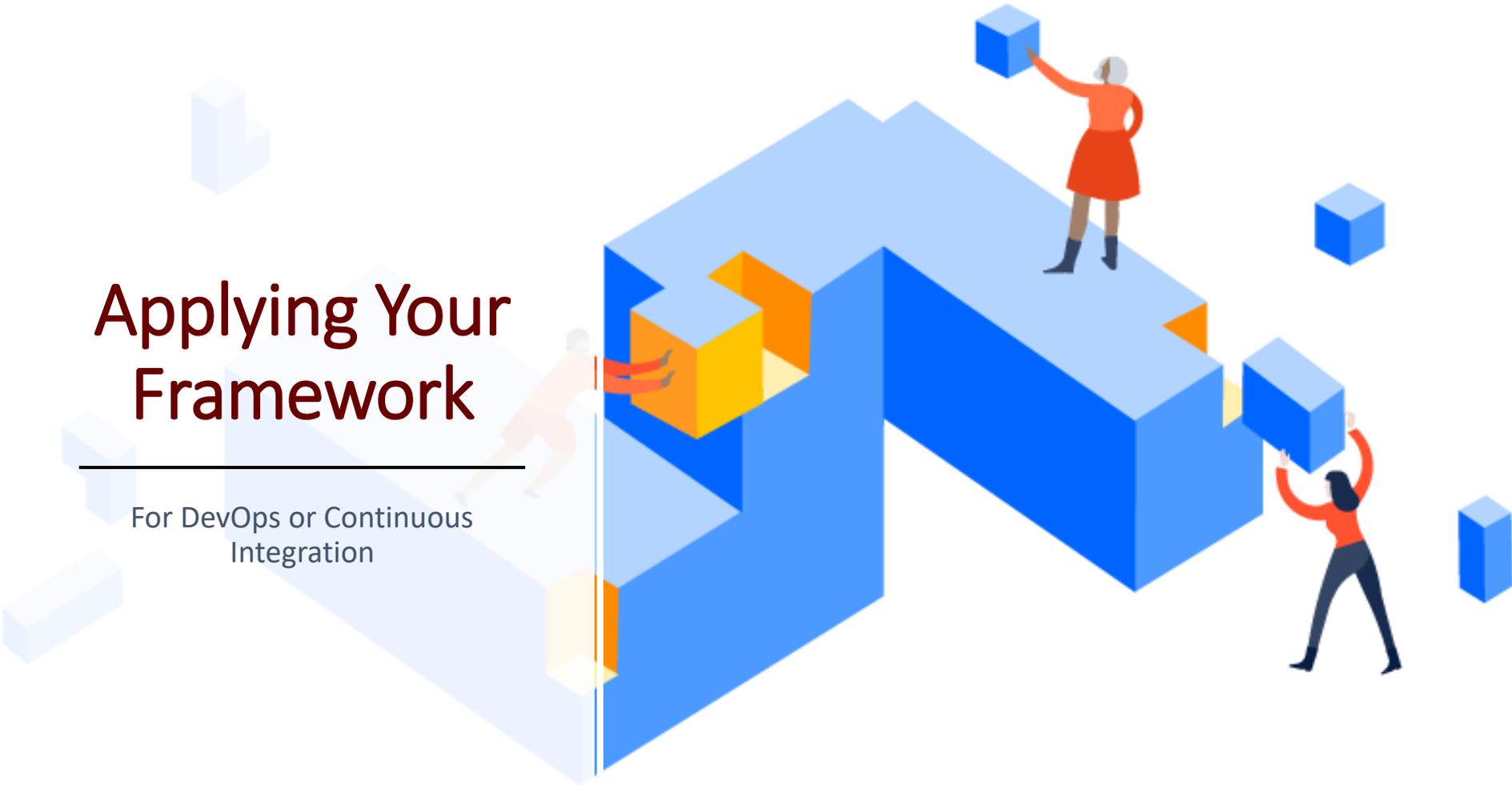
Next steps

➢ Initially start with getting to CI and Continuous Delivery

➢ Start with automation of unit tests

➢ Automate your deployments to stage environment ASAP

➢ Configure CI system to launch all tests based upon appropriate event (build, deployment, or time)

➢ Releasing SW on daily basis? Time to look at Continuous Deployment

Thank you!

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Upcoming Vivit Webinars

February 6, 2018
Project Portfolio Management: What is New v9.42
8:00 - 9:00 AM PST (Los Angeles), 12:00 PM - 1:00 PM EST (New York), 18:00 - 19:00 CET (Frankfurt)
https://vivitworldwide.site-ym.com/events/EventDetails.aspx?id=1057007&group=

February 13, 2018
SIG Talk: Quality & Testing – Testing Tools
8:00 - 9:00 AM PST (Los Angeles), 12:00 PM - 1:00 PM EST (New York), 18:00 - 19:00 CET (Frankfurt)
https://vivitworldwide.site-ym.com/events/EventDetails.aspx?id=1057043&group=

Micro Focus ITOM Summit 2018 * Renaissance Dallas Hotel * February 5-7

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Micro Focus ADM Summit 2018 * Omni Dallas * April 9-11

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