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QTP Training : Level-2

Basics of QTP

People matter, results count.

Understanding "Framework"

- What does "it" mean:
  - A skeletal structure designed to support or enclose something
  - A frame of structure composed of parts fitted and joined together
  - Work done in, on or with a frame or structure

- Definition:
  - A fundamental structure for supporting or enclosing something, especially a skeletal support used as the basis for something being constructed
  - A set of assumptions, concepts, values and practices that constitutes a way of viewing reality

Defining "Framework" – Well, an Attempt !!??

- In all, framework is a structured combination of
  - Various (testing) assumptions
  - Practices
  - Concepts

Ultimate goal is to support "Automated Software Testing"

Framework is an Idea

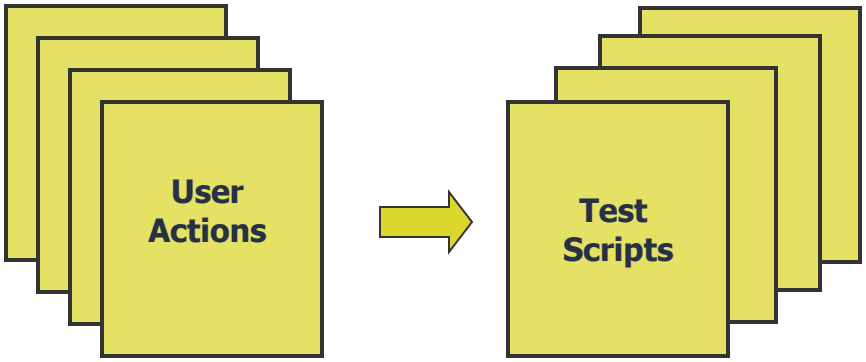
Why Framework

- Outline the Overall Test Structure
  - To Visualize Test Automation "Even before we begin"
- Minimize code development
  - Reduce Maintenance
- Tool Independency
- Repeatable
  - Atleast on homogenic applications
- Portability & Expendability
  - Plug & Play
- Consistency
- Maximize Reusability
- "Ideally" Reduce coding exposure to functional testers

Types of Framework

- Record and Play back
- Data driven
- Component/Modular
- Keyword Driven
- Hybrid

Record & Play Back Automation Framework



Record and Playback

- Script Generation Approach/technique
  - Supported by most of the modern automation tool
  - A micro-like script where each user action is presented
- Adhoc
  - Used for automation of day-to-day activities (Adhoc)
    - Example : if an Engineer need to verify a bug : user creation module, for 1001 user getting data error
- Very limited scope
  - Confined to either Individual tester/functional Requirement
- Shortcomings
  - Hard-coded
  - Error Handling
  - Minimum Reusability
  - High Maintenance (as good as the "creation time" itself)

Data Driven Automation Framework

- "Data" becomes the nucleus
  - Data sits in middle and test cases get repeated with predefined set of Input data and response data coming from AUT
  - To check how the application performs the same operations with multiple sets of data.
- Data Independency
  - Login (user name and password)
- Best suited to tests aimed at larger data sets and less change prone
  - Exmaple :
    - Bank Account creation modules
    - Mail Accounts Creation
    - Forms filling applications

Data Driven Automation Framework

- Example :
- DataTable.AddSheet "LocalSheet" ' This Step is used to add a empty sheet locally in default excel in the Test
- DataTable.ImportSheet "C:\QTPTEST\Login.xls","LoginSheet","LocalSheet" 'This step is used to import dat from specific sheet specific datafile into the above created loacal sheet
- rowCount = DataTable.GetSheet("LocalSheet").GetRowCount 'This step is used to get the row count of the spcifoied sheet in default excel sheet

- For row = 1 to rowCount
- DataTable.GetSheet("LocalSheet").SetCurrentRow(row) 'This step is used to set focus on specified row
- userNAME = DataTable.Value("UN","LocalSheet")' This step is used get the value from sheet in the column "UN"
- pWD = DataTable.Value("PWD","LocalSheet")' This step is used get the value from sheet in the column "PWD"
- PRINT userNAME
- PRINT pWD
- DataTable.Value("Result","LocalSheet") = "TEST"'This Step is used to set a value in specified sheet and in specified column
- Next

- DataTable.ExportSheet "C:\QTPTEST\Login.xls","LocalSheet" 'This step is used to export the local sheet into external excel sheet

Data Driven Automation Framework

- Shortcomings
  - Minimum Reusability
    - Mostly Application/requirement specific scripts
  - Vulnerable to Changes (viz. high maintenance)

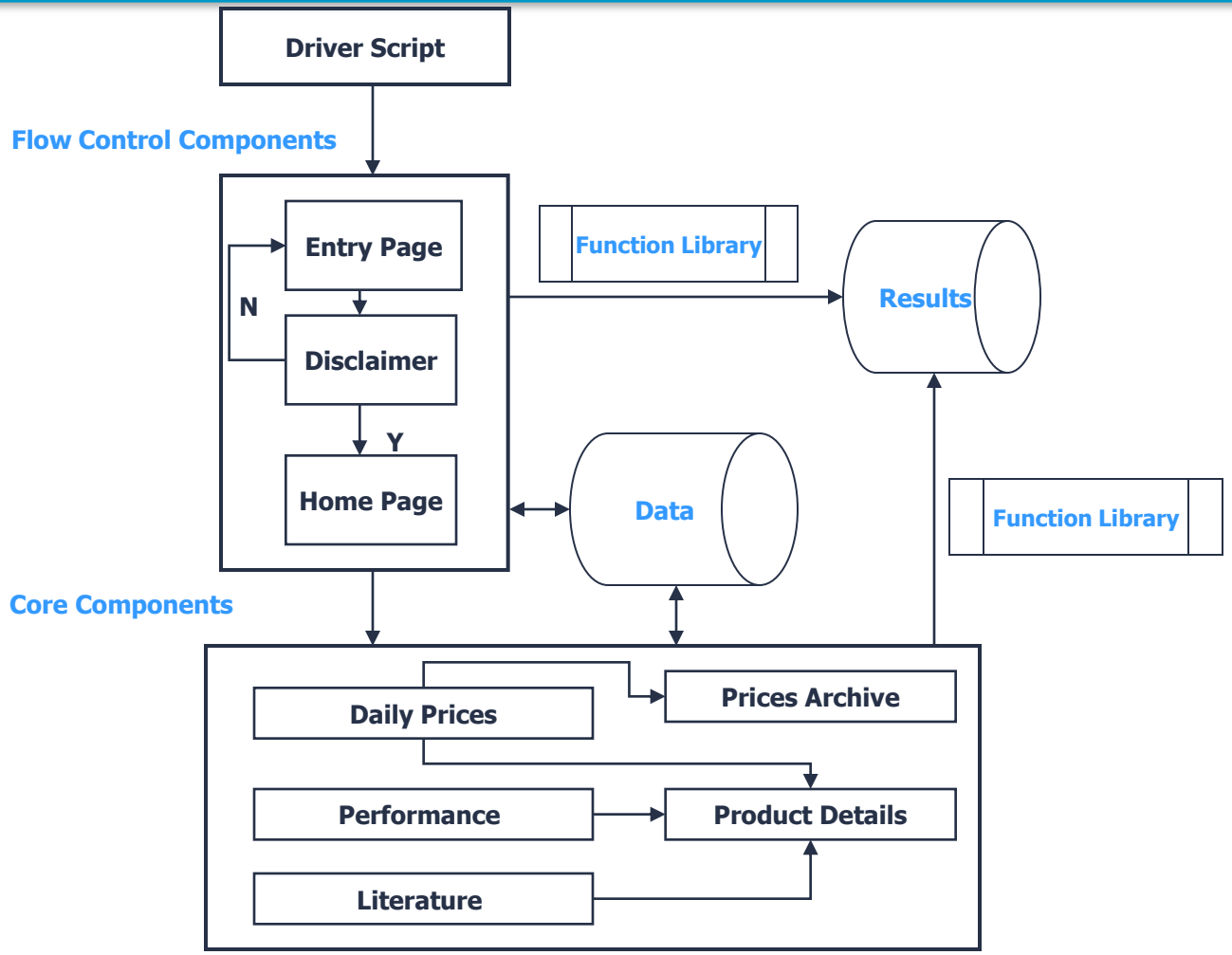
Modular/Component Driven Automation Framework

- Based on typical Functional Decomposition technique
- Built on mutually independent scripts/blocks
- Re-usable components identified
- AUT is fragmented into small blocks
  - Functionalities/Requirements
  - Functional flow
  - System components itself
  - Generic Functions/actions on the AUT
- Also termed as "Test Library Architecture Framework"
  - As functions & modules of the AUT are represented in the form of library (common & application specific) file

Modular/Component Driven Framework….

- Shortcomings:
  - High Maintenance
    - Scripts are generated/created on business logic
  - Dependency among scripts

Implementation Model – Component/Modular Driven Framework



Component/Modular Driven Framework

Example – Contracts Management Application

TC#1

- Login as Internal User
- Create Contract
- Add external Users
- Add terms
- Get Approvals
- Present Contract to External User
- Logout as Internal User
- Login as Internal User
- Login as External User
- Execute Contract

TC#2

- Login as Internal User
- Create Contract
- Add external Users
- Add terms
- Send Contract for Internal Review
- Get Approvals
- Present Contract to External User
- Logout as Internal User
- Login as External User
- Review Contract
- Execute Contract

Microsoft Excel Worksheet

Keyword Driven Automation Framework

- Based on Object/Action relationship

- Objects are Universal
  - Applications are built on objects (Browser, Page, Frame, Text box…) and so the "Keyword" framework
  - Maximum re-usability across homogenic applications

- Objects and the actions are represented in a table format
  - Hence also known as "Table based Automation Framework"

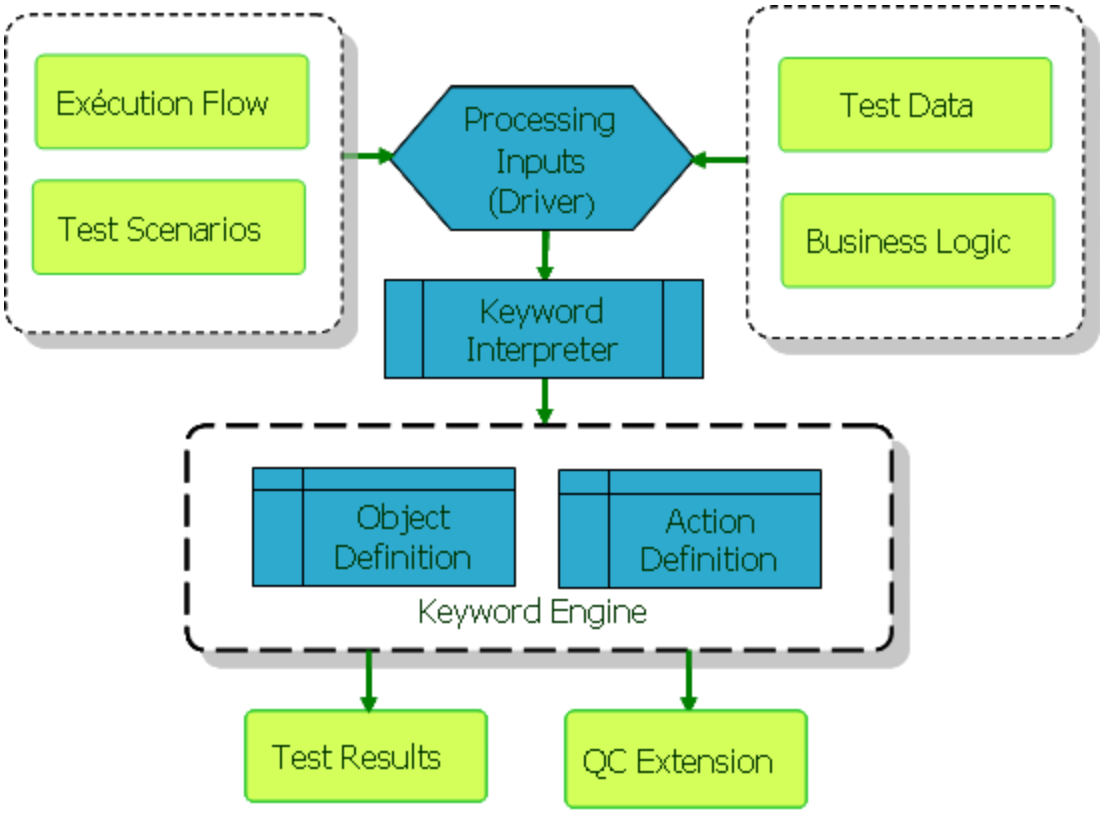
- Business logic Kept outside the script
  - Scripting limits to the definition of Object and the associated actions
  - Minimum Maintainability
    - Best suits for "Change-prone applications

Keyword Driven Automation Framework…

- Portable & Extendible
  - Plug & play
  - Limited to the limitations of the platform used to develop the framework
- Keeps the Scripts (Code) away from framework implementers (functional testers)
- Maximum Reusability
- Greater traceability to manual test cases
- Manual Tester / BA can also do automation
- Re Work will be minimal for functional changes
- Fast Automation is possible with less skilled people in team

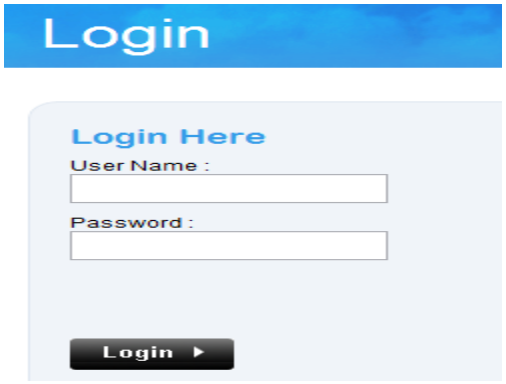
- Shortcomings
  - Effort to do Initial implementation of the framework is higher
  - Wouldn't be best option for AUTs with large data sets

Implementation Model – Keyword Driven Framework



Implementation Model - Keyword Driven Automation framework

Keyword Driven Framework - Example



BrowserName	PageName	ObjectName	KeyWord	Param1	Param2	Param3	Param4
BookTickets	Booking	Login	ClickButton				
Login	Login	User Name:	SetText	suneel			
Login	Login	Password :	SetText	suneel			
BookTickets	Booking	One Way	SelectRadio				
BookTickets	Booking	From:	ListSelect	Chennai			
BookTickets	Booking	To:	ListSelect	Nellore			
BookTickets	Booking	Adult	ListSelect	2			
BookTickets	Booking	Child	ListSelect	0			
BookTickets	Booking	Depart	SetText	09-08-2012			
BookTickets	Booking	BusType	ListSelect	EXPRESS			
BookTickets	Booking	Concession	ListSelect	GENERAL BOOKING			
BookTickets	Booking	CheckAvailability	ClickButton				

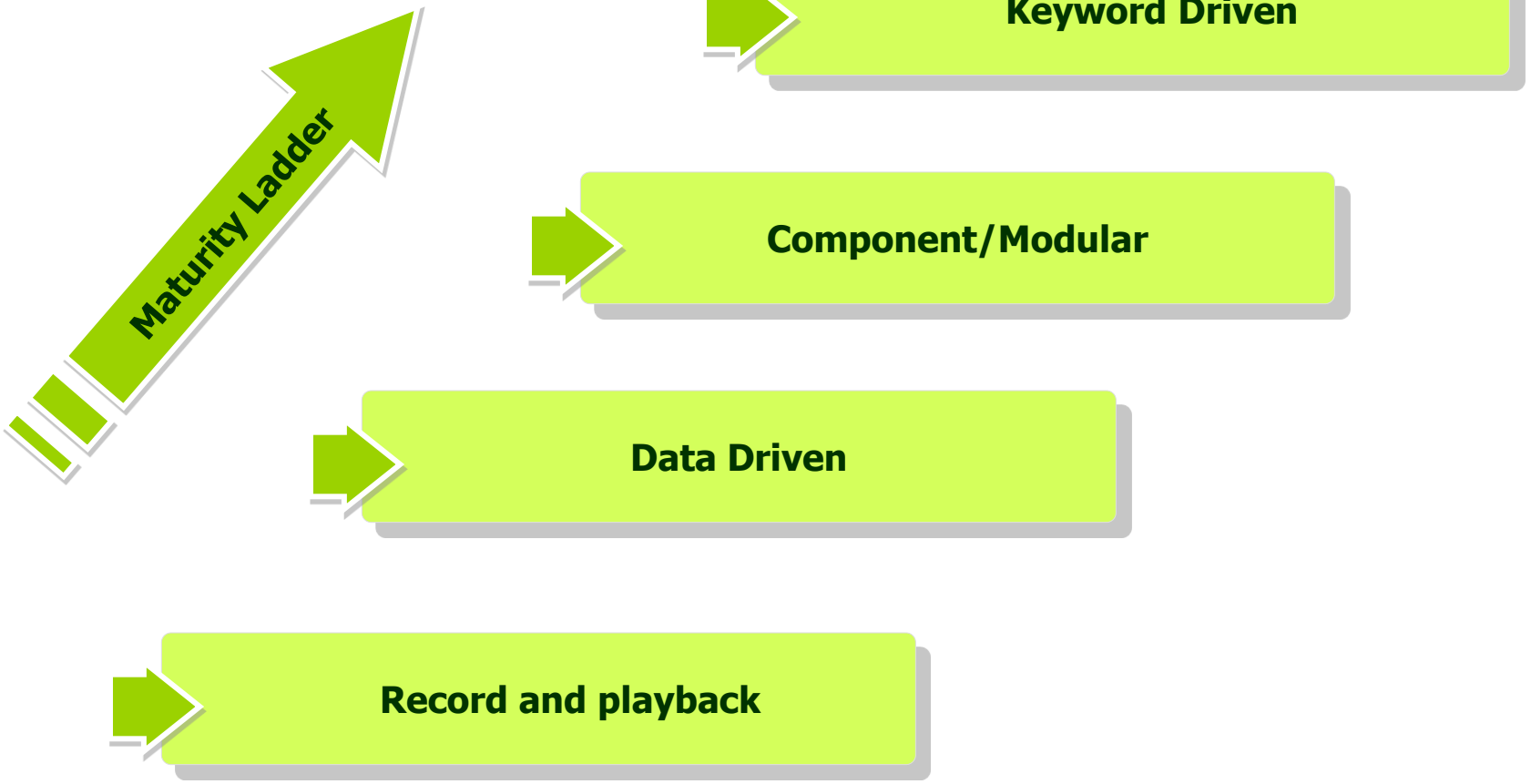
Hybrid Automation Framework

- The most commonly used
- Capitalized on the other techniques
  - Strengths of the other techniques (Record & Playback, Data, Modular, & Keyword) are leveraged
- Most Successful framework
  - Mostly the combination of Keyword + Data driven

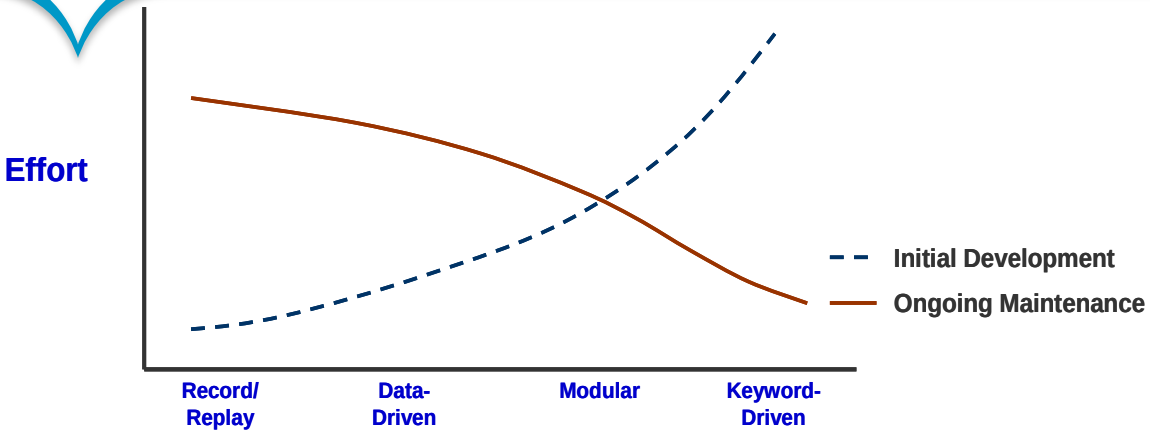
Hybrid Automation Framework

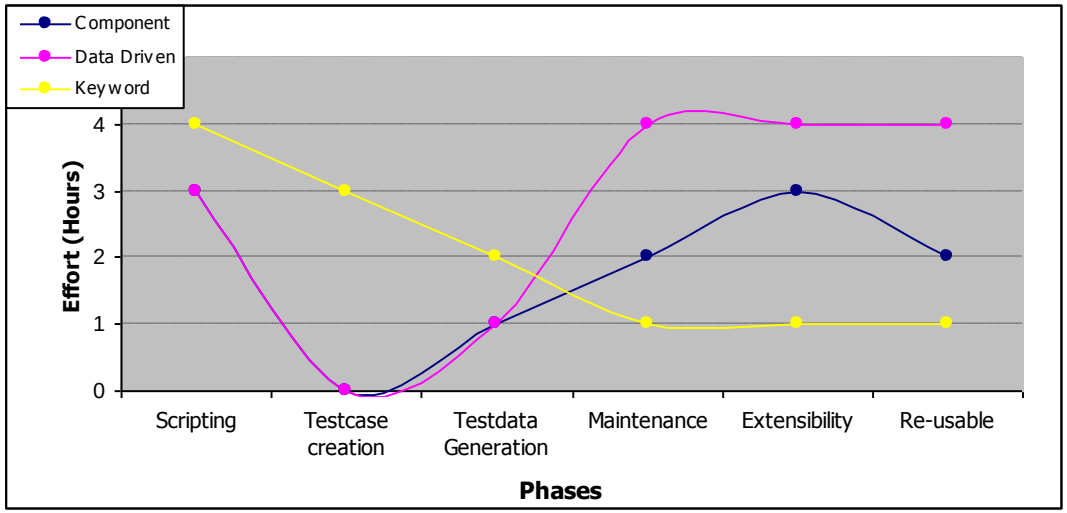
SuiteName	TestCaseId	StepNumber	StepDescription	ExecutionFlag	ActionKeyWord	InputParameter
ICECreditClearing_FS	TC_DCH_FS_01	1	TC # 1.3.3. Triclear Exception - MS Recalls as EB-CDX.NA.IG.HVOL : (	Yes	CREATEFTE	ExcelWorkSheet=TE_TradeCreation.xls|UniqueColName=Comments|UniqColValue=002
ICECreditClearing_FS	TC_DCH_FS_01	2	Get field values required to match trade in Stix	Yes	GETFIELDDATA	PTradeRef=C1:PTradeRef;ProductTypeCode=ClearedIndex|FieldList=Template,Reference
ICECreditClearing_FS	TC_DCH_FS_01	3	Search for the C1 trade in Stix	Yes	SEARCH	TradeId=C1:PTradeRef
ICECreditClearing_FS	TC_DCH_FS_01	4	Create a new trade in Stix	Yes	CREATE	MSBuyProtection=C1:MSBuysSells|IndexIssue=C1:ReferenceEntity|Template=C1:Templ
ICECreditClearing_FS	TC_DCH_FS_01	5	Match trade in Stix	Yes	VERIFYMATCH	TradeId=C1:PTradeRef
ICECreditClearing_FS	TC_DCH_FS_01	6	Verify that the Allocation status of trade in Stix is "Unallocated"	Yes	CHECKTRADESTATUS	TradeId=C1:PTradeRef|TradeStatus=Unallocated
ICECreditClearing_FS	TC_DCH_FS_01	7	Verify TradeFlow Status in C1. It should be in "New-Pending Sales A	Yes	TRADESTATUS	PTradeRef=C1:PTradeRef|ProductTypeCode=ClearedIndex|strTradeFlowState=Live New|
ICECreditClearing_FS	TC_DCH_FS_01	8	Search trade using Trade Ref	Yes	SEARCH	PTradeRef=C1:PTradeRef|TradeOperation=Clearing|SearchBy=Trade IDs|FlowType=EB
ICECreditClearing_FS	TC_DCH_FS_01	9	Retrieve Platform ref for the trade	Yes	RETRIEVEDATA	PTradeRef=C1:PTradeRef;FieldList=EntityType,EventType,Notional,PlatformRef
ICECreditClearing_FS	TC_DCH_FS_01	10	Verify Trade is RECIEVE the ALLEGED from STIX in Triclear	Yes	VERIFYMESSAGE	PTradeRef=C1:PTradeRef;ExchangeType=INTERNAL_ALLEGE|ConversationEntity=STIX|Exc
ICECreditClearing_FS	TC_DCH_FS_01	11	Verify Trade is sent to ICE from Triclear -> Transaction History	Yes	VERIFYMESSAGE	PTradeRef=C1:PTradeRef;ExchangeType=TRADE_SUBMISSION|ConversationEntity=ICELN
ICECreditClearing_FS	TC_DCH_FS_01	12	Verify Acknowledgement from ICE in Triclear -> Transaction Histor	Yes	VERIFYMESSAGE	PTradeRef=C1:PTradeRef;ExchangeType=ACKNOWLEDGEMENT|ConversationEntity=ICEL
ICECreditClearing_FS	TC_DCH_FS_01	13	Search trade in ICE (HF1) under Transactions tab	Yes	HF1SEARCH	RefId=TRICLEAR:PlatformRef|FlowType=EB|TabSelection=TRANSACTIONS
ICECreditClearing_FS	TC_DCH_FS_01	14	Affirm trade in ICE	Yes	AFFIRM	FlowType=ClearingEB|NumberOfFunds=1|Fund=msc_hf1_le6|NotionalAmount=991|FC
ICECreditClearing_FS	TC_DCH_FS_01	15	Search trade in ICE (HF1) under Transactions tab	Yes	HF1SEARCH	RefId=TRICLEAR:PlatformRef|FlowType=EB|TabSelection=TRANSACTIONS
ICECreditClearing_FS	TC_DCH_FS_01	16	Verify Buyer approval in ICE HF1 Application	Yes	ICEVERIFY	WindowName=ICELink_HF1|StatusVerify=PROTECTIONBUYER|strExpectedStatus=True
ICECreditClearing_FS	TC_DCH_FS_01	17	Verify Seller approval in ICE HF1 Application	Yes	ICEVERIFY	WindowName=ICELink_HF1|StatusVerify=PROTECTIONSELLER|strExpectedStatus=True
ICECreditClearing_FS	TC_DCH_FS_01	18	Search trade using Trade Ref	Yes	SEARCH	PTradeRef=C1:PTradeRef|TradeOperation=Clearing|SearchBy=Trade IDs|FlowType=EB
ICECreditClearing_FS	TC_DCH_FS_01	19	Verify Triclear receive Allege from ICE	Yes	VERIFYMESSAGE	PTradeRef=C1:PTradeRef;ExchangeType=EXTERNAL_ALLEGE|ExchangeStatus=ALLEGED|Cc
ICECreditClearing_FS	TC_DCH_FS_01	20	Verify Triclear send Booking Request to STIX	Yes	VERIFYMESSAGE	PTradeRef=C1:PTradeRef;ExchangeType=BOOKING_REQUEST|ConversationEntity=STIX|E
ICECreditClearing_FS	TC_DCH_FS_01	21	Verify Allocation is approved in STIX	Yes	CHECKTRADESTATUS	TradeId=C1:PTradeRef|TradeStatus=Allocated (1)
ICECreditClearing_FS	TC_DCH_FS_01	22	Verify Allocation is created in C1 under Trade Groups tab and Bloc	Yes	TRADESTATUSONLY	PTradeRef=C1:PTradeRef|ProductTypeCode=ClearedIndex|strTradeFlowState=Live New|
ICECreditClearing_FS	TC_DCH_FS_01	23	Search trade using ICE Transaction ID for Retrieveing CB Trade	Yes	SEARCH	PTradeRef=TRICLEAR:PlatformRef|TradeOperation=Clearing|SearchBy=Platform Refs|Fl
ICECreditClearing_FS	TC_DCH_FS_01	24	Verify Triclear receive Status update for Cleared from ICE	Yes	VERIFYMESSAGE	PTradeRef=TRICLEAR:PlatformRef;ExchangeType=EXTERNAL_ALLEGE|ExchangeStatus=ALL
ICECreditClearing_FS	TC_DCH_FS_01	25	Verify Triclear sends Status update for Cleared to C1	Yes	VERIFYMESSAGE	PTradeRef=TRICLEAR:PlatformRef;ExchangeType=BOOKING_REQUEST|ConversationEntit
ICECreditClearing_FS	TC_DCH_FS_01	26	Search the trade in ICE as DL1	Yes	DL1SEARCH	RefId=TRICLEAR:PlatformRef|FlowType=FS|TabSelection=ICETransactionId
ICECreditClearing_FS	TC_DCH_FS_01	27	Recall trade as EB from ICE (DL1) and Verify Buyer Approval as Rec	Yes	ICEVERIFY	WindowName=ICELink_DL1|StatusVerify=RECALL|strExpectedStatus=True
ICECreditClearing_FS	TC_DCH_FS_01	28	Search CB trade in C1 under Trade serach tool using External ID (IC	Yes	SEARCH	ExternalId=TRICLEAR:PlatformRef|TraderName=qtriclr
ICECreditClearing_FS	TC_DCH_FS_01	29	Verify Trade in C1 for pending approval	Yes	TRADESTATUSONLY	PTradeRef=C1:CBTradeRef_0|ProductTypeCode=ClearedIndex|strTradeFlowState=Non-L

Frameworks Compared

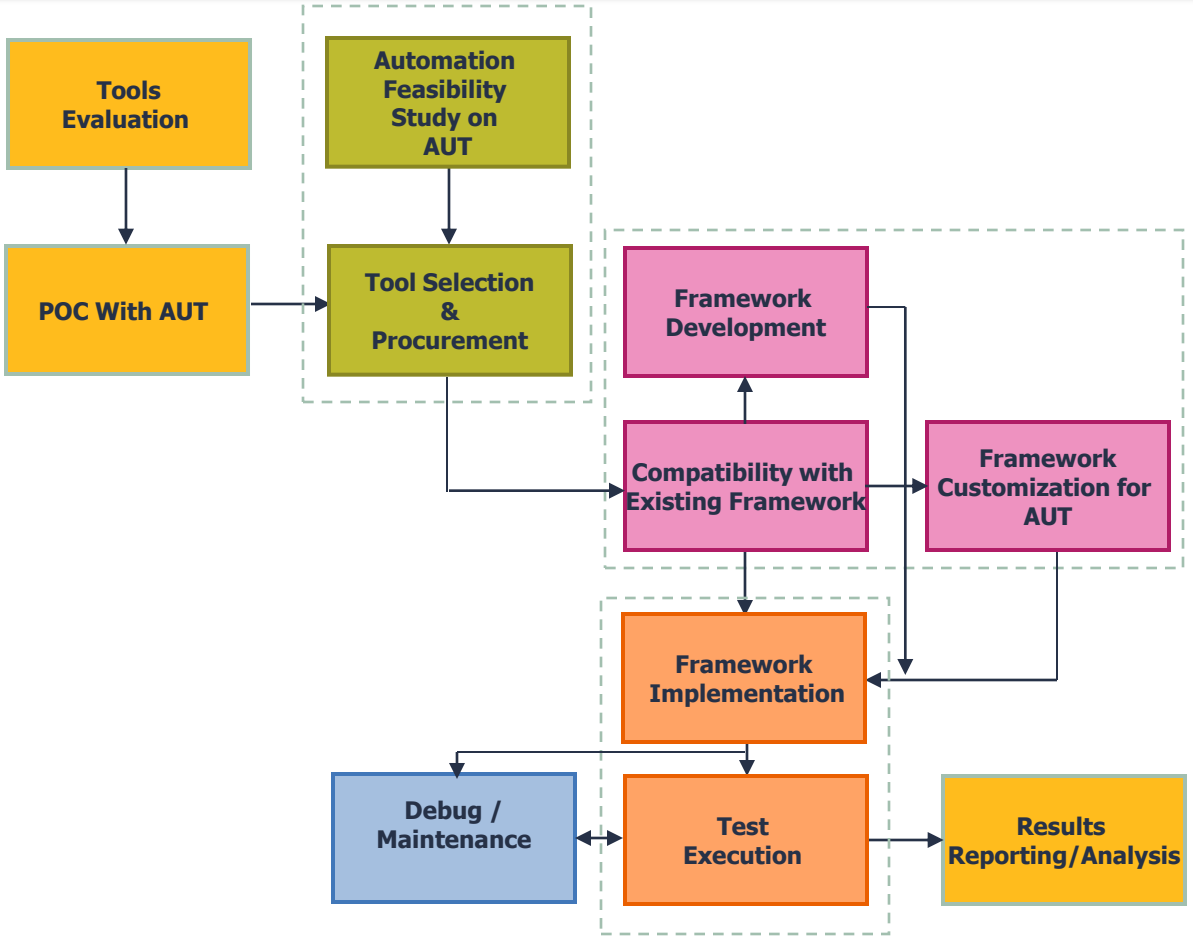


Methodology (Vs) Phase (Vs) Effort





Test Automation Process – Framework Approach



Test Automation Process – Framework Selection

- Application Behavior
- Expected ROI
- Expertise in Team
- Re Work Probability

Test Automation Process – Tool Selection

- Application Behavior
- Budget
- Expected ROI
- Resources
- Technology
- Tool Support
- Resources in market

Test Automation Process – Automation Process

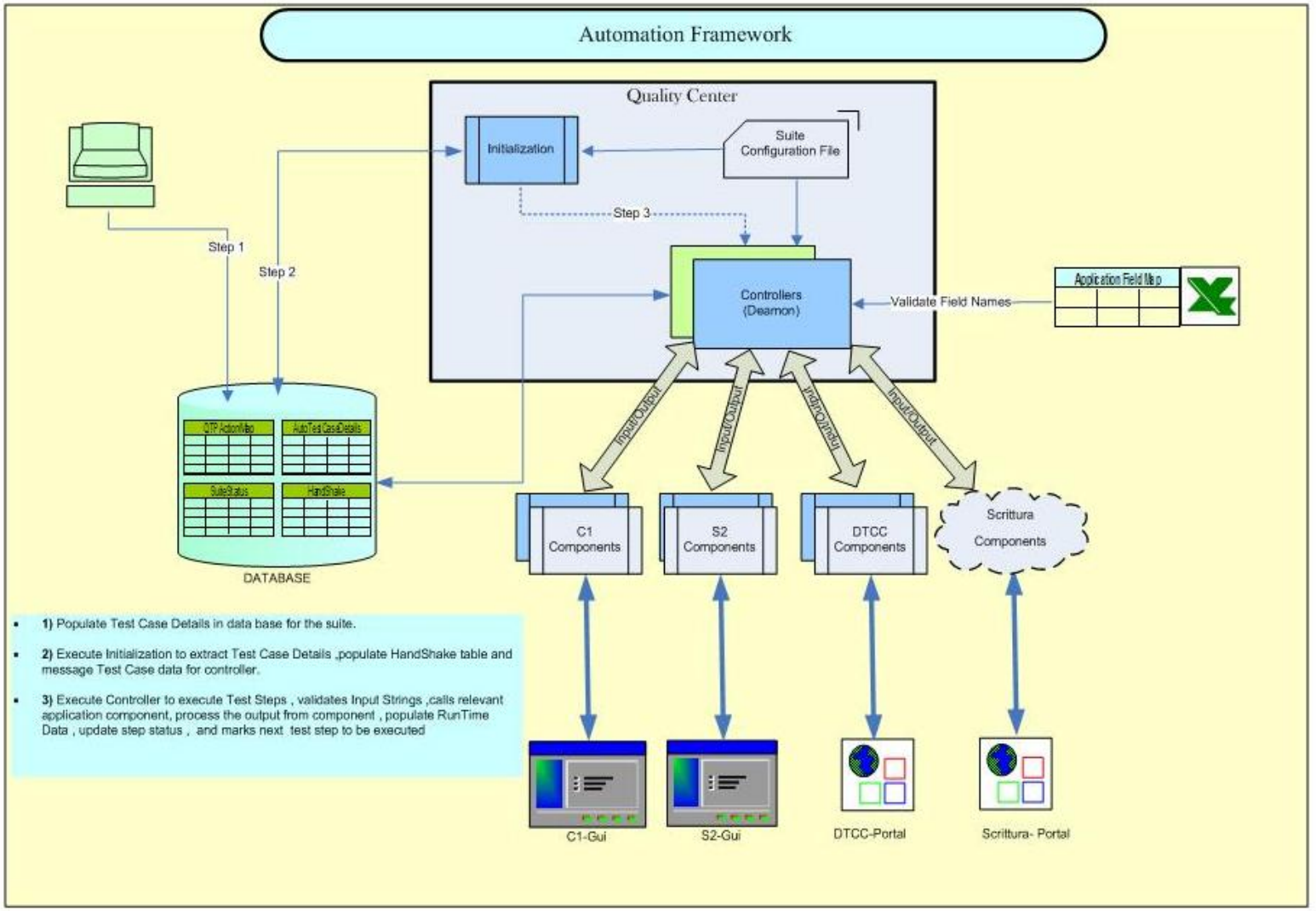
- POC
  - Feasibility
  - Approach
  - TCs for Automation
  - Tentative Estimations
  - Risks
- Automation Plan
- Pre Review
- Object Repository
- Test Data Preparation
- Re Usable Components
- Test Case wise automation
- Debugging and Execution
- Post Review
- Sign-Off / Release notes

Automation Architecture

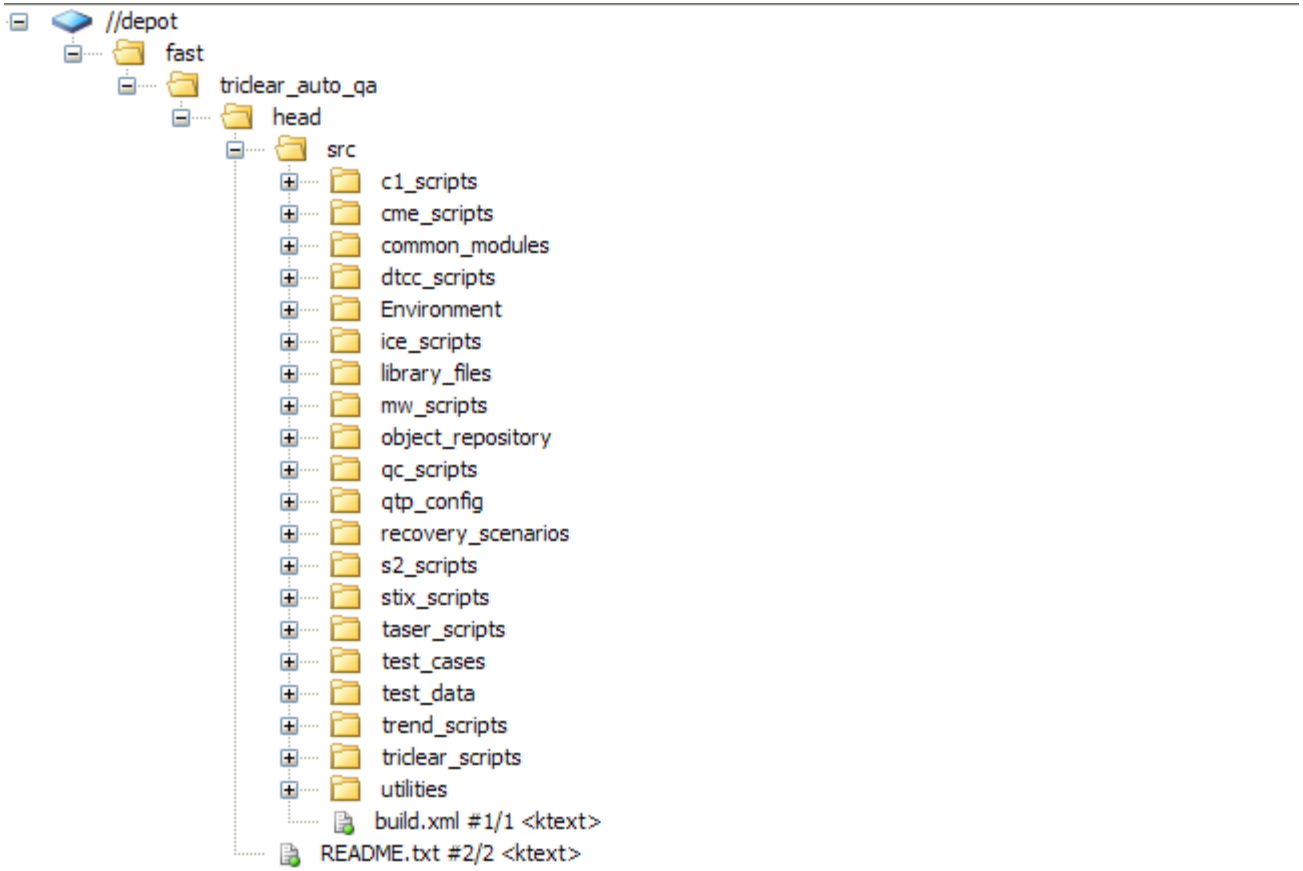
- What is being tested?
- How is the test set up?
- Where are the inputs coming from?
- What is being checked?
- Where are the expected results?
- How do you know pass or fail?
- Where I can have reusable components?

Automation Architecture – Example 1

Architecture diagram

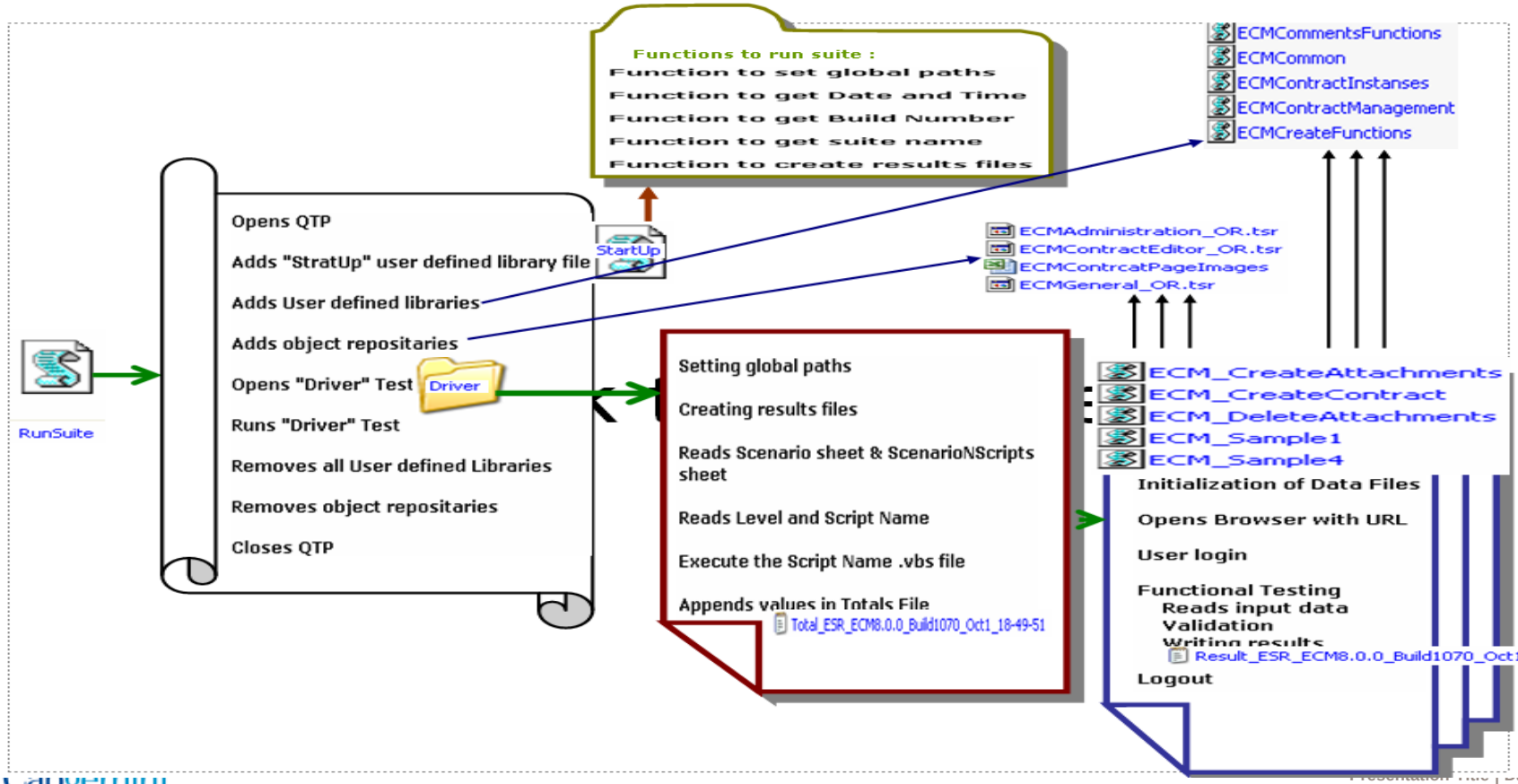


Automation Architecture – Example 1



Automation Architecture – Example 2

Logical Flow:



Test Automation Process – Automation Process

Q&A

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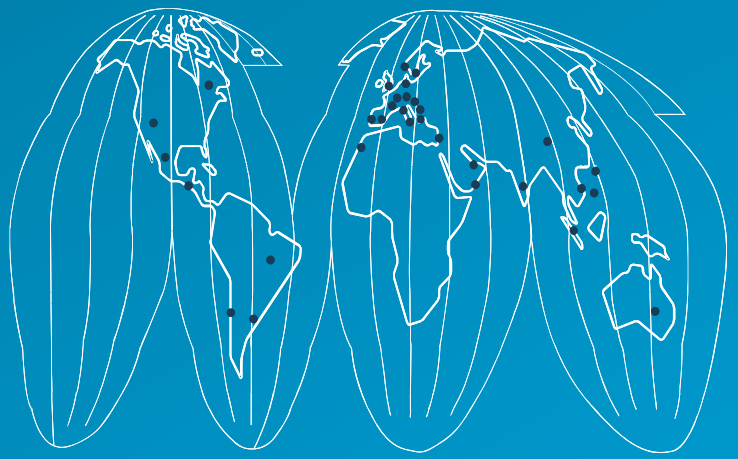

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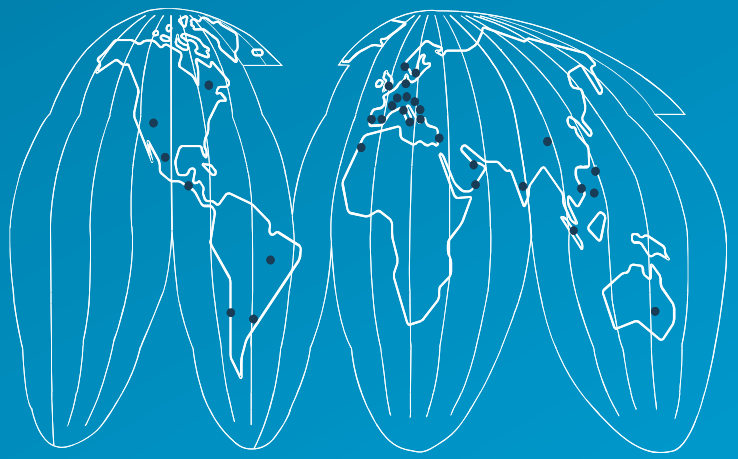

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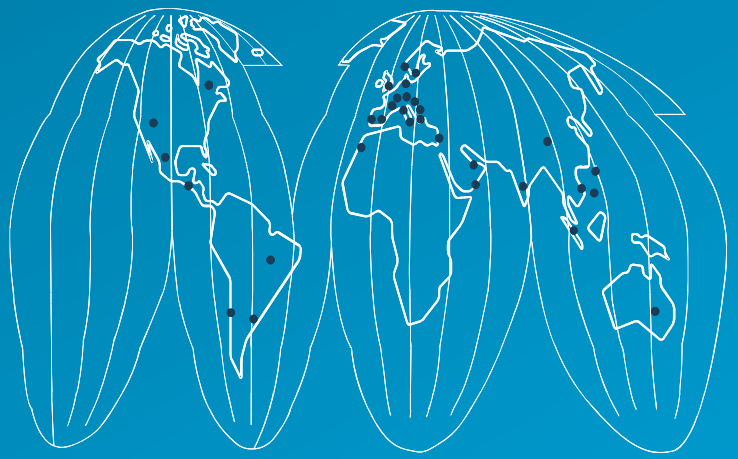

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