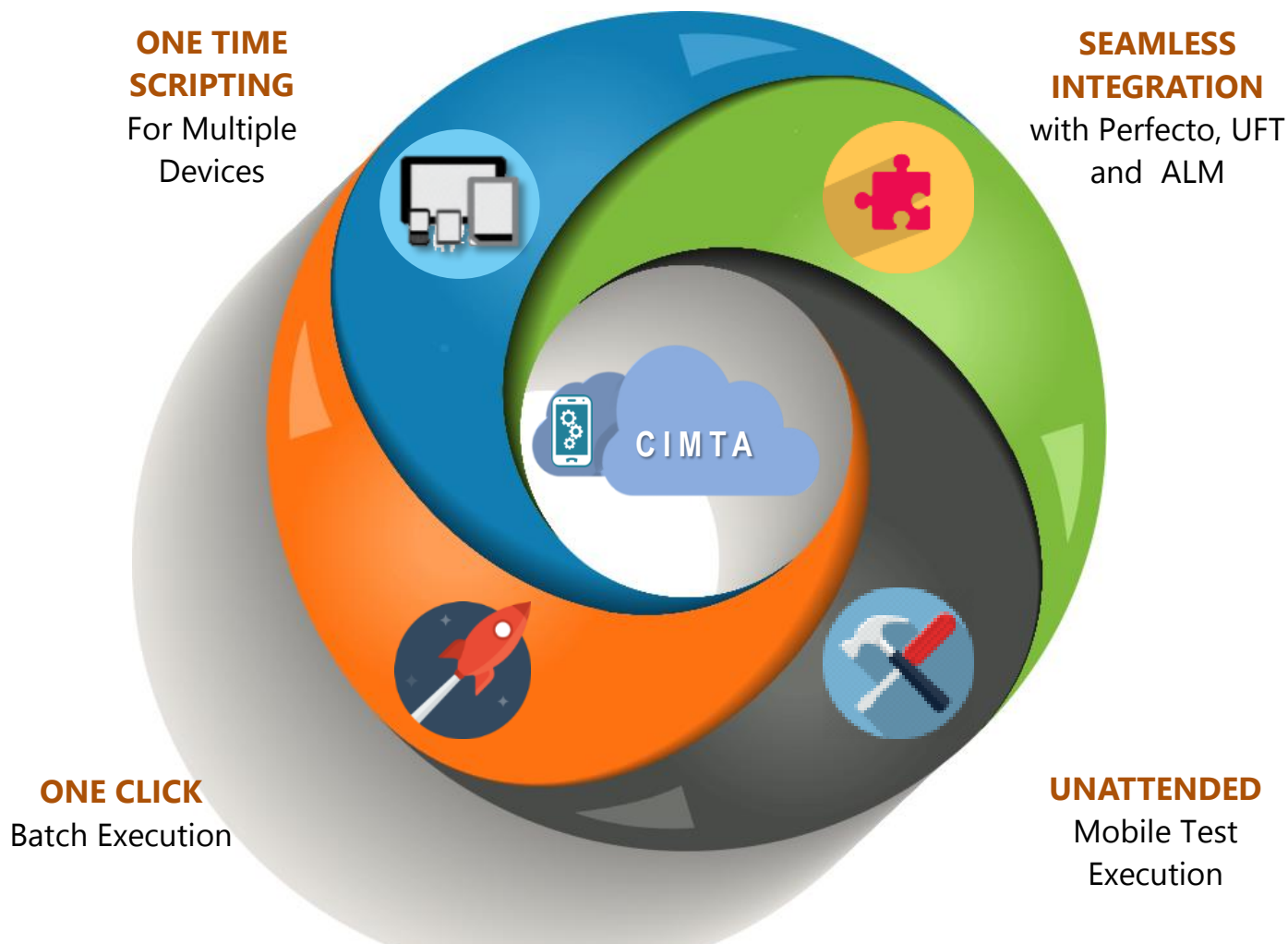


CLOUD BASED INTEGRATED MOBILE TEST AUTOMATION SOLUTION (CIMTA)

In house automation solution developed for Unattended Mobile Test Execution on Perfecto Cloud



Conceptualized & Implemented by Manulife Automation Team



- ✓ ALM driven Automation Test Management
- ✓ ALM & UFT Mobile integration with Perfecto Cloud Solution
- ✓ Leverages CRAFT as Automation Framework
- ✓ Automated Customized Result Reporting, DUT Video and Screenshot Capture for Client Acceptance and Signoff

Quality Assurance in a Digital World - Cloud Integrated Mobile Test Automation Solution

Seamless Integration of HP UFT / ALM & Perfecto Mobile for Automation Testing of Applications for Mobile Devices hosted on the Cloud

Executive Summary

Globally the mobile market is extremely fragmented, ever changing and evolving. Every week there are dozens of new devices being constantly added to the existing list of mobile products already available in the market. To keep up with this demand and logistical nightmare, one either needs to purchase and maintain these devices while testing them or use a cloud service that will help manage the demand of testing the devices. Testing on a Cloud platform enables testers to easily access real mobile devices connected to real mobile networks spread in different geographical locations.

The solution seeks to provide a mechanism for easy implementation of Testing of Mobile Applications for devices stored on the Perfecto Mobile Cloud. This approach of testing on real devices always yields actual results with no need to worry about “false negative” and “false positive solutions”.

Additionally the testing can itself be done either manually or by leveraging Test Automation Implementation Techniques. Test Automation Implementation of Mobile Application Testing helps achieve the quick precise results needed to accommodate faster development cycles. With the availability of a vast range of Automation Tools and their related features it becomes imperative to implement the optimum solution not just in terms of the implemented Framework/Tools but also the most optimized implementation techniques possible.

This white paper discusses an approach which can

lead to considerable benefits for IT Projects using HP Testing Product Suite and Perfecto Mobile as the identified tools of choice. Our **Cloud Integrated Mobile Test Automation Solution (CIMTA)** built leveraging Cognizant Solution Accelerators like CRAFT & AHEAD for achieving integration between UFT, Perfecto Mobile and ALM is capable of testing mobile applications for devices stored on the cloud.

Among other benefits, CIMTA leads to potential efforts savings of not only up to 80% Manual Testing Effort but also up to 60% Effort Savings when compared to other mobile automation implementation techniques like Perfecto Native Automation.

The proposed **CIMTA** solution has applicability across industries where HP Testing Product Suite and Perfecto Mobile are the identified Test Tools of Choice.

Cognizant Automation Team
@ Manulife Canada



Problem Statement

Currently there exists no defined solution which can be leveraged for Mobile Test Automation Implementation at Cognizant for Projects with HP Testing Product Suite and Perfecto Mobile as identified tools of choice. This white-paper aims to propose a solution which can be used for Mobile Test Automation Implementation at Projects where UFT, ALM and Perfecto Mobile are available. The solution also addresses some of the gaps which exist with implementation of Perfecto Native Automation.

High Level Solution

The solution uses Cognizant Solution Accelerator CRAFT as underlying Automation Framework for achieving integration between UFT, Perfecto Mobile and ALM. Using the out of the box integration feature between UFT and ALM, it provides a mechanism to store Automation Scripts developed using UFT Mobile in ALM and drive text execution leveraging all the Test Management Features of ALM. Also addresses common Test Automation Concerns arising from the usage of Perfecto Native Automation like

- Non-availability of out of box integration with ALM
- Subdued ability to incorporate complex programming logic.
- Lack of advanced Test Automation features like Descriptive Programming.
- Manual Results Management post automation execution completion.
- Lack of end to end Test Execution Management Features.

Solution Details

The solution seeks to leverage Cognizant Solution Accelerators/IP like CRAFT, AHEAD etc. to achieve a Test Automation approach capable of testing mobile applications for devices stored on the cloud. The same is achieved by

- Creating UFT Mobile Scripts.
- Logically grouping the code snippets present in the developed UFT Mobile Script under Keywords defined as Functions.
- Creating CIMTA Test Scenarios by arranging the Keywords one after the other in the Business Flow Sheet of the CIMTA Scenario Data table
- Testing of the same scenario for multiple devices can be accomplished by creating iterations for each Test Scenario mapped to individual Device ID's which are present as a Test Data Column for each iteration. Alternatively a one to one implementation of Automation Test Cases for each Device is also

possible.

- Creating a CIMTA keyword for opening the Mobile Cloud in dashboard view as a workaround to the DUT not being visible while running UFT Mobile Scripts from ALM.
- Setting the Device ID for the DUT at runtime using the UFT setTOPProperty Method in the keyword handling Device Allocation at the start of execution run for each iteration.
- Upload of all Test Artefacts to ALM by leveraging AHEAD.
- Custom HTML Reports generation and attachment to ALM Test Run for each Test Scenario.
- Each validation point screenshot capture in Word Document and attachment to every Test Run in ALM.
- UFT Run Results and associated Video for each DUT in a Test Scenario is attached to ALM Test Run for Client Acceptance and Sign Off.

CIMTA SALIENT FEATURES

- Out of Box Integration with ALM
- Adaptability of developed Scripts to run on multiple Devices.
- Enhanced Programming Logic Incorporation.
- Advanced Test Automation Features like Descriptive Programming
- End to End Automation Execution & Result

CIMTA Architecture Diagram

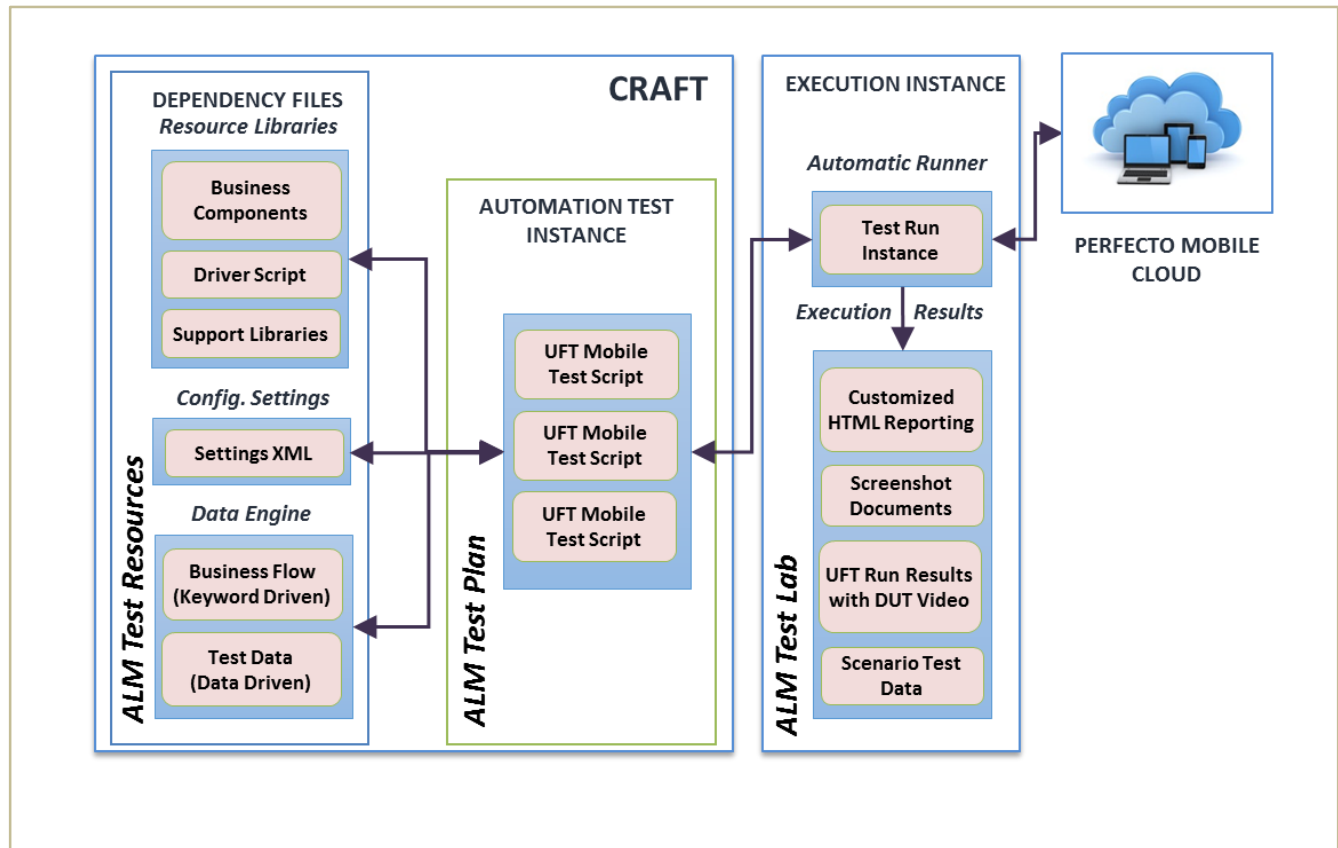


Figure 1 : CIMTA Architecture Diagram

Benefits

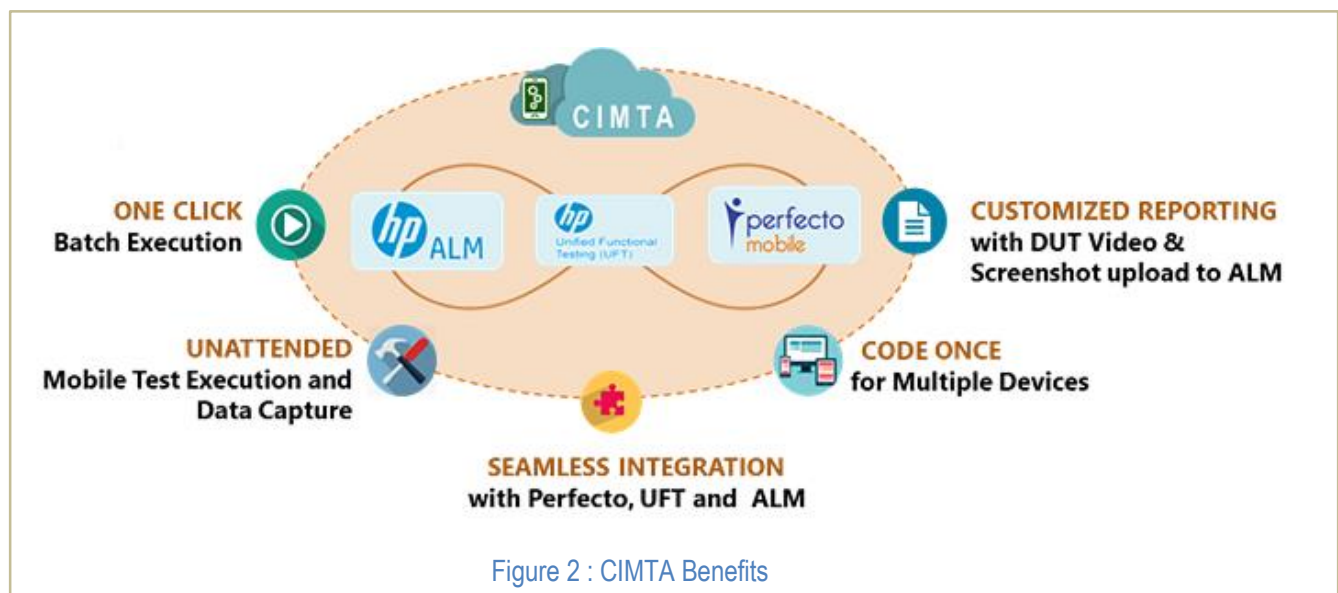





Figure 2 : CIMTA Benefits

Applicability across industries where HP Testing Product Suite and Perfecto Mobile are the identified Test Tools of Choice

Implementation Technique Comparison:: Perfecto Native VS CIMTA

 FEATURE LIST  		
Test Designing		
Code Once	★ ★ ★	★ ★ ★ ★
Enhanced Code Reuse	★ ★ ★	★ ★ ★ ★
Enhanced Error handling	★ ★ ★	★ ★ ★ ★
Data driven Test Case Designing Scope	★ ★ ★	★ ★ ★ ★
Test Execution		
One Click Batch Execution	★ ★ ★	★ ★ ★ ★
Unattended Execution	★ ★ ★	★ ★ ★ ★
DUT Video Capture Feature	★ ★ ★	★ ★ ★ ★
Test Reporting		
Customized Reporting	★ ★ ★	★ ★ ★ ★
GUI Based	★ ★ ★	★ ★ ★ ★
Others		
Out of the Box ALM Integration	★ ★ ★	★ ★ ★ ★
Maintaining Data security	★ ★ ★	★ ★ ★ ★

Case Study

About the Customer



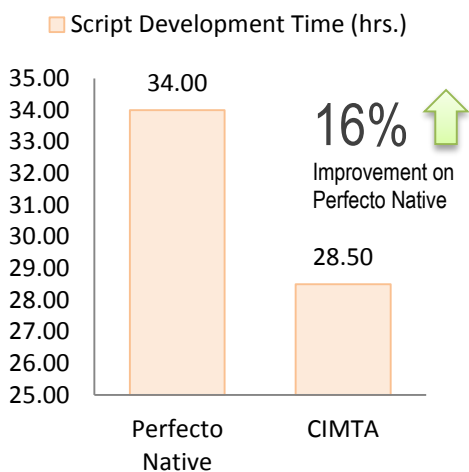
Manulife is a leading Canada-based insurance company and financial services provider, with head office in Toronto, Canada.

Test Specifics

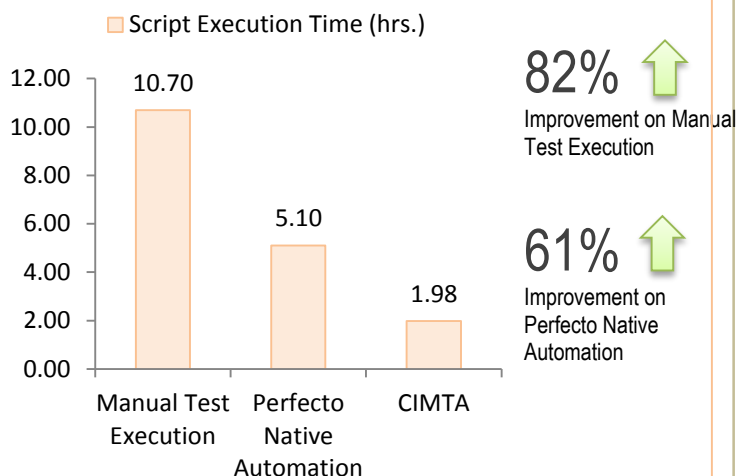
- 25 Automation Scenarios – 1 Device Each
- Tested on 4 Devices
 - a. Nexus 6,
 - b. iPhone 6 Plus,
 - c. Samsung Galaxy S5
 - d. Blackberry Z10



Script Development Time

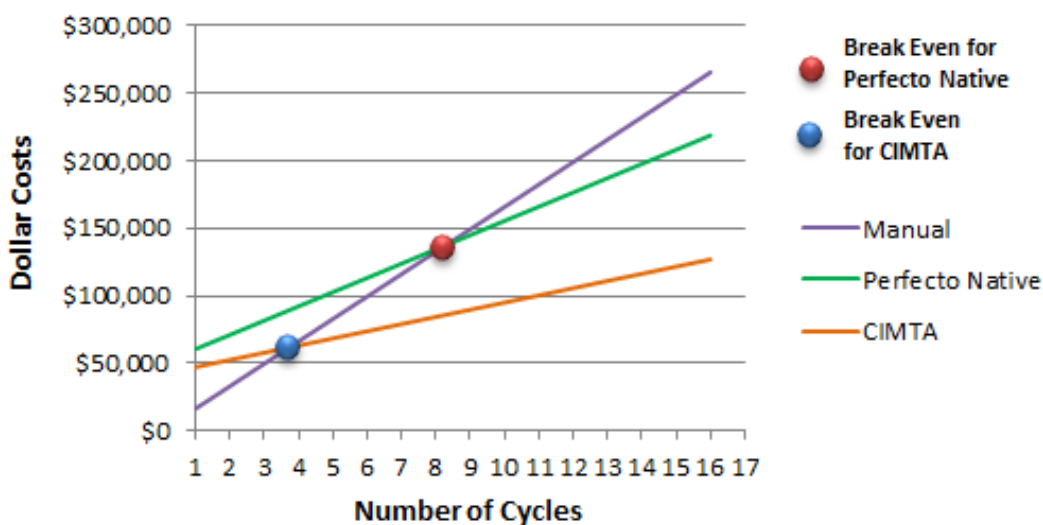


Script Execution Time



CIMTA ROI

CIMTA Break Even Cycles (for 25 test cases)		Perfecto Native Break Even Cycles (for 25 test cases)	
Script Dev Time (1 Time Effort) (hrs.)	28.50	Script Dev Time (1 Time Effort) (hrs.)	34.00
Script Maintenance Effort (Every Cycle) (hrs.)	1.43	Script Maintenance Effort (Every Cycle) (hrs.)	1.70
CIMTA vs Manual Test Execution Savings (Per Cycle) (hrs.)	8.72	Perfecto Native vs Manual Test Execution Savings (Per Cycle) (hrs.)	5.60
Cycles to attain Break Even	3.91	Cycles to attain Break Even	8.72



CIMTA ROI*

Average Cycles Per Year (Projected*)	12								
Blended Rate (\$/hrs)	45.6								
Number of Test Cases (Projected*)	850								
	Manual			Perfecto Native Automation			CIMTA		
	Y1	Y2	Y3	Y1	Y2	Y3	Y1	Y2	Y3
Test Execution Time (Hrs Per Cycle Per Test Case)	0.43	0.43	0.43	0.20	0.20	0.20	0.08	0.08	0.08
Script Development Time (Hrs Per Test Case)	0.00	0.00	0.00	1.36	0.00	0.00	1.14	0.00	0.00
Script Maintenance Effort (Hrs per Cycle Per Test Case)	0.00	0.00	0.00	0.07	0.07	0.07	0.06	0.06	0.06
Total Effort Per Year (Execution + Development + Maintenance) (Hrs Per Test Case)	5.14	5.14	5.14	4.62	3.26	3.26	2.78	1.64	1.64
Total Costs Per Year (\$ per Test Case) *	234.20	234.20	234.20	210.85	148.84	148.84	126.59	74.60	74.60
Cumulative 3 Year Costs (\$ per Test Case) *	720.60			508.53			257.79		

*Should be readjusted based on Project Needs

		CIMTA vs MANUAL TESTING	CIMTA vs PERFECTO NATIVE AUTOMATION
CUMULATIVE 3 YEARS SAVINGS	\$	\$362,794	\$197,831
	%	61%	46%

Future Enhancements

Continuous Integration

Conclusion

- A robust Test Automation Solution helps keep pace with Agile Software Delivery and maximizes the benefits of Test Automation. CIMTA Solution adoption helps achieve the same.
- CIMTA as opposed to standalone Perfecto Native Automation Implementation drives productivity and facilitates code reuse ultimately enhancing the quality of resulting software

About the Authors



Cognizant QnE Automation Team @ Manulife Canada were instrumental in conceptualizing and implementing the CIMTA Solution. For additional details please reach out at CIMTA@cognizant.com.

About Cognizant

Cognizant (NASDAQ: CTSI) is a leading provider of information technology, consulting, and business process outsourcing services, dedicated to helping the world's leading companies build stronger businesses. Headquartered in Teaneck, New Jersey (U.S.), Cognizant combines a passion for client satisfaction, technology innovation, deep industry and business process expertise, and a global, collaborative workforce that embodies the future of work.

With over 75 development and delivery centers worldwide and approximately 211,800 employees as of June 30, 2015, Cognizant is a member of the NASDAQ-100, the S&P 500, the Forbes Global 2000, and the Fortune 500 and is ranked among the top performing and fastest growing companies in the world. Visit us online at www.cognizant.com or follow us on Twitter: Cognizant.



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