



Test Automation with CBTA: Benefits, Challenges and Opportunities

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Elizabeth Gilchrist, Business Analyst
Lockheed Martin
Session ID #84495

About the Speakers

Theresa Prawdzik

- Application Software Development Analyst, Lockheed Martin
- 17 years with Lockheed Martin; 13 with SAP COE
- Currently supporting Enterprise Solution Manager
 - Process Management, Test Suite including CBTA, BPCA, Focused Insights dashboards
- Outdoor enthusiast (hiking, biking, novice running)

Elizabeth Gilchrist

- Senior Systems Integration Business Analyst, Lockheed Martin
- Bachelors in Business Administration; Masters in Information Systems
- Currently supporting Lockheed Martin's Enterprise Procure to Pay system
 - Test Automation, Ariba, SRM, Sourcing
- Certified Black Belt and trained Scrum Master
- Involved in local art scene; volunteer for the annual 24 hr. summer art festival

Key Outcomes/Objectives

1. Why choose CBTA?
2. CBTA Lessons Learned/Tips
3. Understand integration opportunities within SAP Solution Manager

Agenda

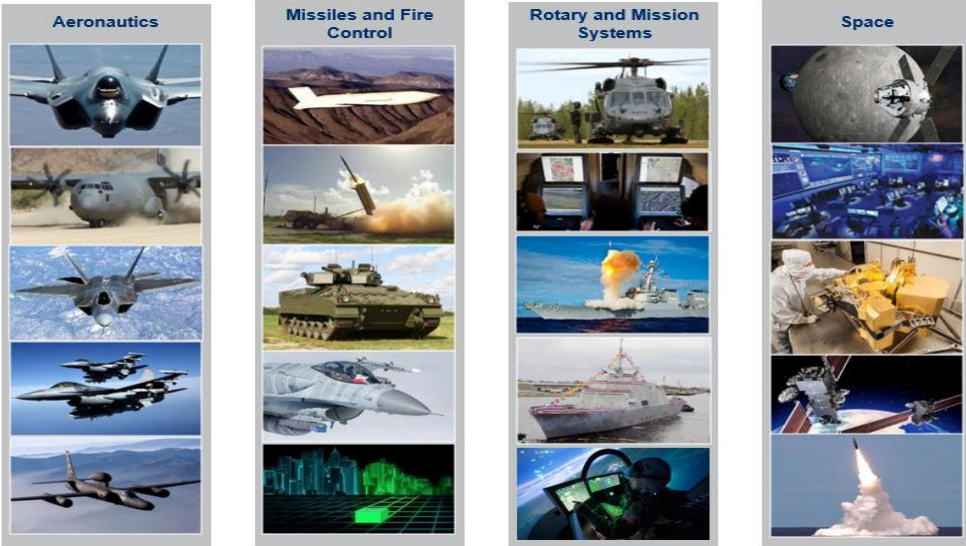
- Lockheed Martin Overview
 - Solution Manager Use
- What is CBTA
 - Why CBTA?
- Lockheed Martin Procure to Pay Project (LM P2P) experience with CBTA
 - CBTA Benefits
 - CBTA Challenges
 - Tips/Tricks
 - Opportunities
- Next steps
- Lessons Learned
- Questions

Lockheed Martin Corporation - Who Are We?



Your Mission is Ours.

Headquartered in Bethesda, Maryland, Lockheed Martin is a worldwide global security, aerospace and information technology company that is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services



LM International - Cross Business Capability Integration

105,000
Employees



54,000
Scientists and
Engineers



375+
Facilities
Worldwide



Operating in over
54 Countries

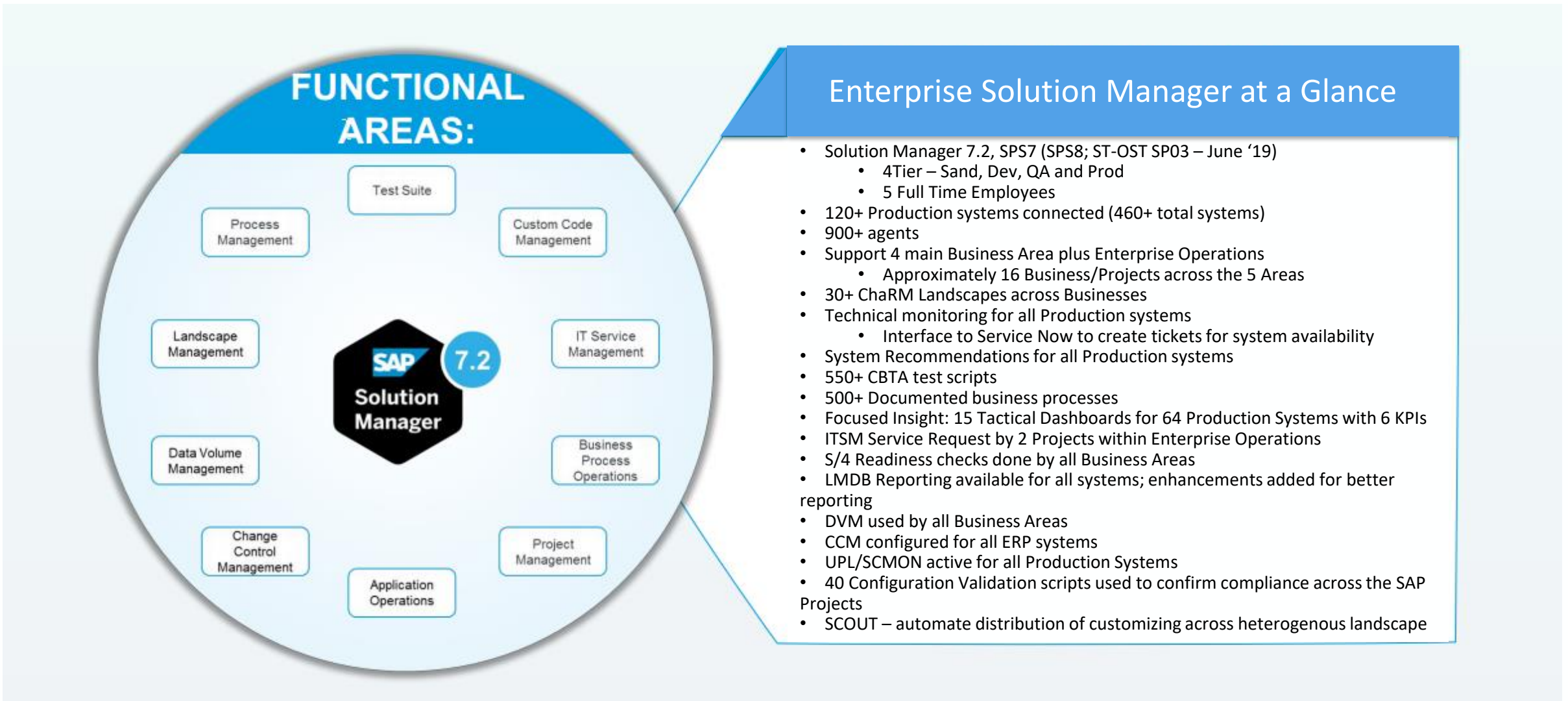


With **7,500+**
Employees

- **2018 Sales:** \$53.8 Billion
- **Backlog:** \$130.5 Billion
- **Stock Ticker Symbol**
 - LMT, on the New York Stock Exchange.
 - Ranked 59th on the 2018 *Fortune 500* list industrial corporations



LM Enterprise Solution Manager - What We Support



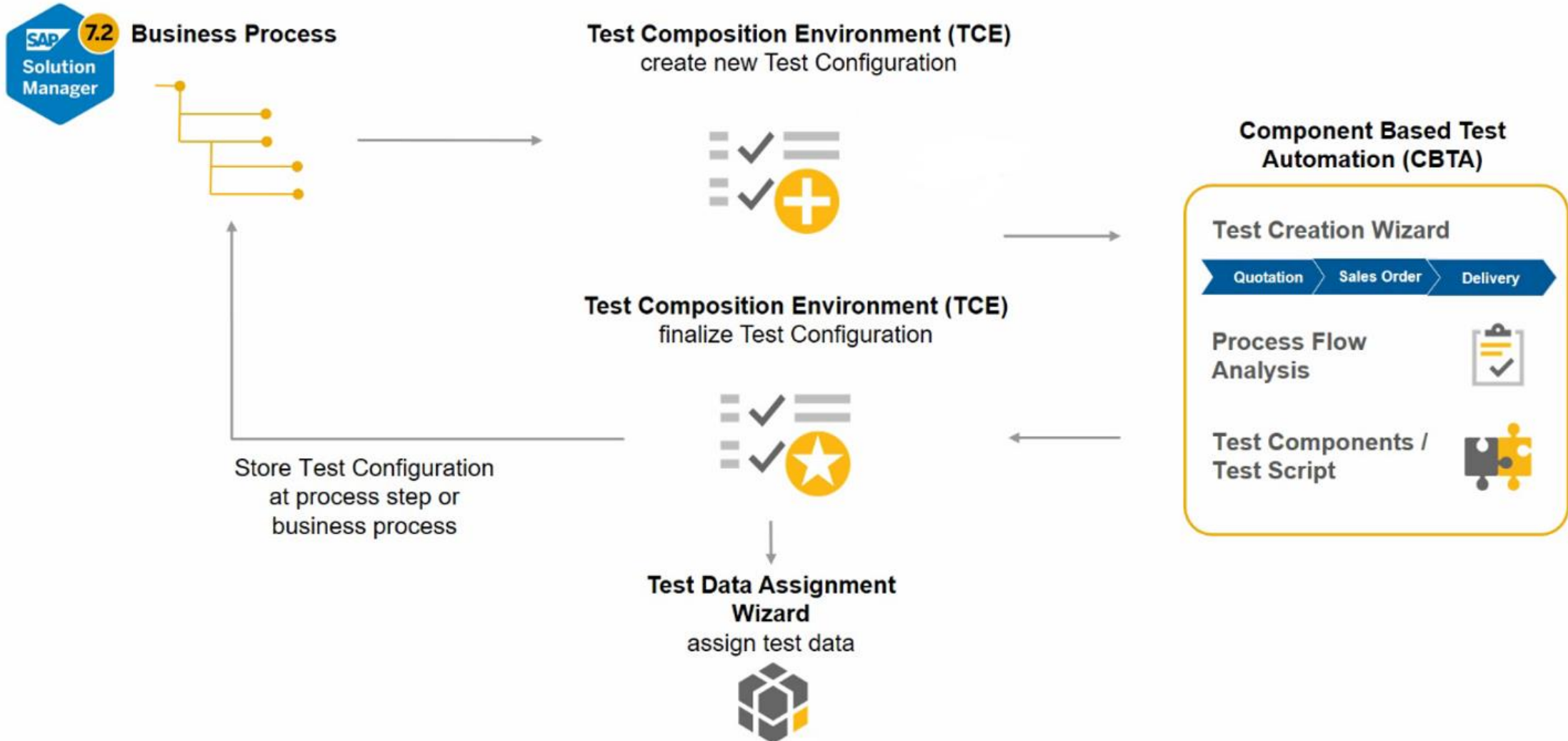
Active participants in Solution Manager Influence Council and Customer Connection Program

ASUG

What is CBTA?

- Component based test automation (CBTA) is the test automation tool integrated into SAP Solution Manager
 - Front end component
 - Test automation framework
- Allows business scenarios to be recorded and test scripts generated
 - Test scripts are composed using SAP delivered default components and customer specific screen components
 - Every element on the screen/page (input field, button, checkbox, link, etc.) has a URI (Uniform Resource Identifier) which is captured during recording and used to locate the element on execution
- A CBTA test is an eCATT object

CBTA Process Flow



** Start by defining your critical business processes in Solution Documentation!*

Why CBTA?

- Record and playback tool does not require programming knowledge
- Included with SAP Solution Manager (no additional licensing)
- Solution Manager Test Suite supports the entire testing process from determining test scope, test planning and execution, defect management and reporting
- Fully integrated with other Solution Manger functionality
 - All related information in 1 central location
- Allows scheduling of test execution
- Integrated reporting in Solution Manager (for automated and manual testing)
- Supports most SAP UI technologies
 - SAP UI5, Fiori, SAP GUI, CRM web-client, WebDynpro...
- Cross technology recording in one session (ex: start with CRM and continue on SAP UI5...)
- Enables chaining of multiple CBTA scripts to create an end-to-end automated business process test

CBTA is the first choice for all SAP automated application testing at Lockheed Martin

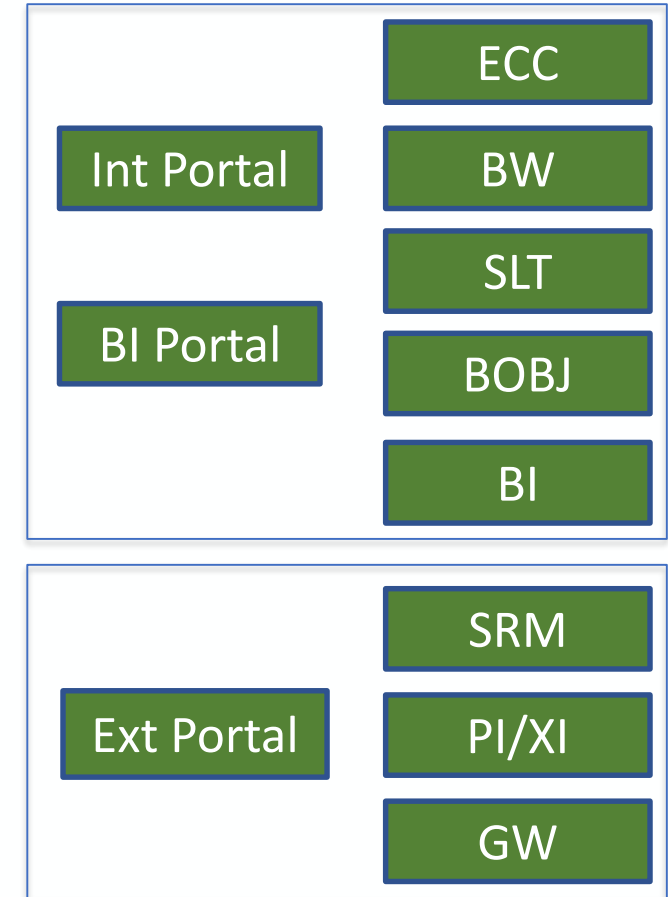


What is LM P2P?

Common Procure to Pay System across Lockheed Martin



Significant Improvements...Internally & Externally



LM P2P Approach for Test Automation

1 Select test automation tools from SAP and /or certified partners

2 Create automated tests for single business transactions (SAP, non-SAP)

3 Create automated composite tests for business processes (SAP, non-SAP)

4 Identify and validate test data and assign to automated tests

Test Automation Framework

5 Derive test plan with automated regression tests via BPCA change impact analysis

6 Schedule and run automated tests online or in "lights-out" mode

7 Analyze test execution results and assess status

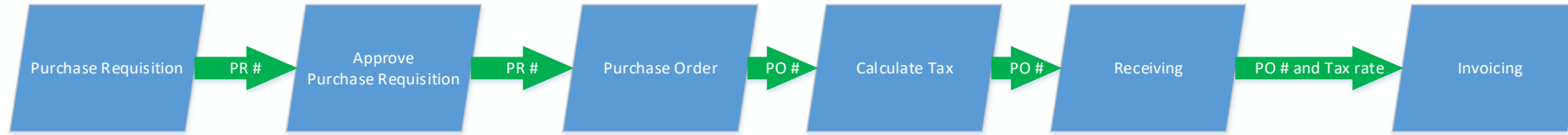
8 Create Defects for application errors and "Damage" for damaged test cases

**from SAP's Best Practice Approach for functional test automation*

LM P2P CBTA Use

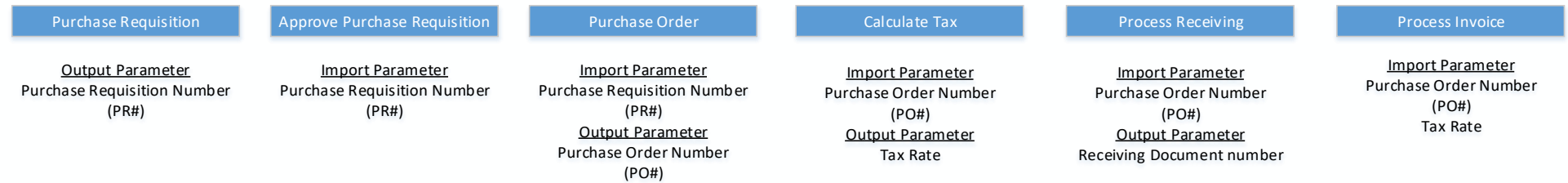
- Over 450 CBTA automated test scripts developed
- UI technologies
 - Portal, WebDynpro, ECC, SRM, SUS, UI5, Personas, GUI
- Nearly 120 composite end to end scripts assembled
 - Average time to create a simple individual test script: 2-3 hours
 - A composite regression test of average complexity and length (~10 test scripts): approximately 1 week
- Test data containers
- Test plans/packages
- Test Scheduling
- Business Process Change Analyzer (BPCA)

End to End Scenario Example



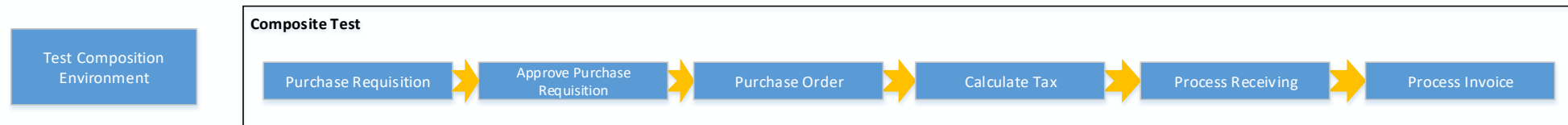
1

Create individual scripts for each process step with export/import parameters



2

Assemble the Composite Test



3

Optional: Assign Test Data



Benefits of CBTA

- Entry level team members can create CBTA test scripts
- Allows resources to work more critical projects and testing efforts
- Increase test coverage
- Improve quality
- Consistent testing across each test cycle
- Reuse CBTA tests in mini-releases (not just large regression test efforts)
- Reduce testing timelines and risk
 - Regression Test
 - Recorded over 66% of the regression steps
 - Yielded between 50-75% reductions in cycle test time
 - Estimated Cost savings \$100K per regression cycle



→ Time Savings -- Avoid Human Errors -- Faster Execution -- Re-use ←

CBTA Challenges

- Creating CBTA tests requires Solution Manager client to be opened for changes
- Limited detailed training and documentation available from SAP
- Unable to run CBTA tests against Productive clients
- Unable to restart a failed script from point of failure
- Non-SAP screens do not always play back successfully
- Application changes may result in required script maintenance
- Reporting gaps (no test step level metrics)
- Known Limitations
 - SAP NetWeaver Portal is only partially supported
 - IE5 Quirks mode and document mode IE 7/8 are not supported from CBTA 3.0.9 or higher
 - Drag and drop capabilities are not recorded
 - See SAP Notes 1835958 - CBTA 3.0 : Known Issues and 2595987 - Object Spy Limitations for details

CBTA Tips/Tricks

- Reuse scripts for different process variants by including if/else
- Insert logic to swap variable URI elements
- Use CBTA embedded within CBTA vs. test type Composite
- For loop has to be manually incremented
- For composite scripts containing more than 20 test scripts split the process into separate composites to improve run stability
- Use of secondary machines or remote desktops during execution
- Use of built in algorithmic functions like random number generator and date functions to reduce parameter updates
- Utilizing “miscellaneous” script to avoid total re-records and capture process updates

CBTA Tips/Tricks

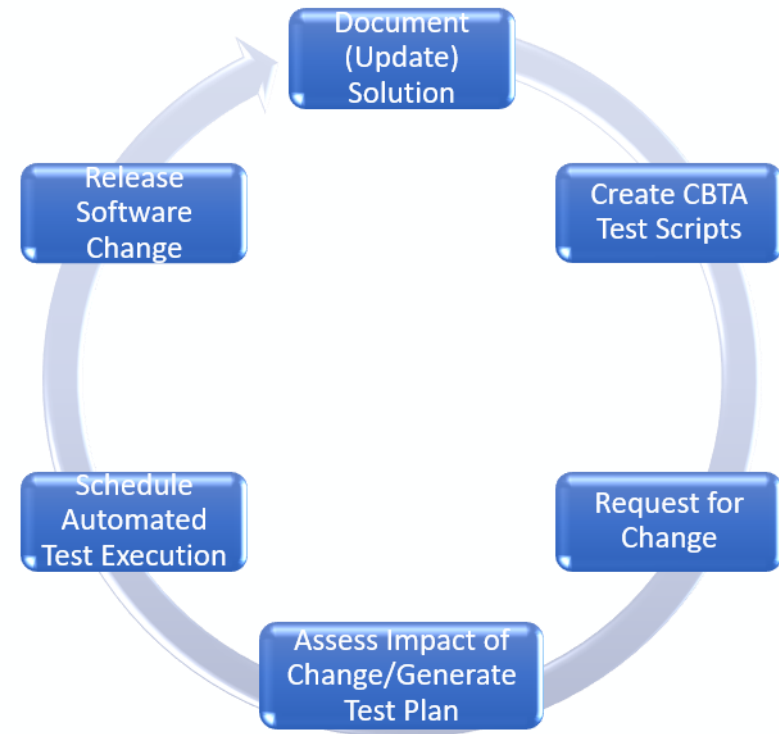
- Use of checkpoints
- Test Data Container vs New Composite
- Mass URI update vs individual line URI update
- Set up CBTA to open browsers full screen
- Keep your CBTA front end client and Runtime library up to date to receive the latest fixes and enhancements from SAP

CBTA Opportunities

- Solution Manager Integration Scenarios
 - Process Management
 - Change and Release Management
 - Business Process Change Analyzer
 - Defect and Incident Management
- Scheduling unattended tests in mass
- Multiple browser support (as of CBTA 3.0 SP10)
- Test data generation
- Create custom functions using Runtime Library Manager
- Multiple test data variants for different testers and/or system roles
- 3rd Party integration
 - Solution Manager test automation framework allows you to plug in other 3rd party test automation solutions via open interface (MicroFocus, Worksoft, Tricentis)

Next Steps

- Use already created CBTA tests to generate dynamic TBOMs
- Full integration of demand, process, change, release and test management
 - Document Solution Manager ALM processes using SAP Best practice content
 - Create CBTA tests to support annual SP updates
 - BPCA to identify and optimize regression test scope
 - Defect management
- Additional SAP GUI Testing for LM P2P
- Evaluate custom reports for Test Suite
- Focused Build to support Agile Development
- Dashboards to measure DevOps KPIs (test automation rate, change velocity)
- Solution Manager Support pack 8 upgrade



Lessons Learned

- Create your test configurations directly in Solution documentation
- Start by creating CBTA test scripts at the single transaction level then combine to create End to End Scenario tests
- Generate dynamic TBOMs during automated test execution
 - Add TBOM-specific roles to the SAP Solution Manager user and the technical user on the System Under Test (SUT)
- CBTA Self-check to troubleshoot common configuration issues
- Prepare valid test data before recording
- Disable SAP GUI security popups during CBTA recording or execution activities
- Use “Execute to Step” option to insert or re-record steps
- Reset client setting to non-production after system refresh
 - SE16 Table T000 -> CCCATEGORY must not be ‘P’

Lessons Learned

- Set realistic automation goals
- Experts say you need 10,000 hours to become an expert in something*
- Treat test automation like a development effort (dedicated / focused time)
- Assign resource/s with sufficient time to devote to script development
 - Plan for Application/Business Process SME support
 - Assigning non-SMEs could increase development time
- Scheduling time on your calendar to work on only automation
- Plan for script maintenance
 - Keep your CBTA test engineers engaged or plan for knowledge transfer to avoid loss of expertise

* Gladwell, Malcolm. (2011) *Outliers: The Story of Success*

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Presentation Materials

Access the slides from 2019 ASUG Annual Conference here:

<http://info.asug.com/2019-ac-slides>

Q&A

For questions after this session, contact us at
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