CONFORMIQ

Case Study:

International Financial Organization Accelerates Testing of its Customized SAP Applications for Faster Deployment

Background

An international financial institution headquartered in the United States that provides loans to developing countries for capital programs to promote international trade with the goal of reducing poverty was looking for a testing process improvement. The bank customizes the SAP NetWeaver transaction codes and then manually performs testing. This methodology was taking too long and allowing defects to slip through into deployment. Clearly, investing in more testers or spending more time testing were not options they wanted to pursue. The bank realized it was time to look to new technology to improve both time to deployment as well as reducing defect slip through.

Conformiq presented its Conformiq 360° Test Automation™ solution as a way to transform testing to greatly improve the bank's current manual test design process. After a series of presentations and technical discussions the bank decided to go forward, allowing Conformiq to demonstrate end-to-end automation, utilizing Conformiq 360° Test Automation integrated with their systems development life cycle (SDLC) tool chain.

Results: Conformiq 360° Test Automation validated all goals during project delivery, including accelerating testing time and project schedules, reducing testing effort and resources, improving test design productivity, reducing risk via improved test coverage, 100% known requirements test coverage, automating requirements traceability, integration with the existing SDLC flow, and custom test reports.

Project Deployment

The Conformiq 360° Test Automation solution includes Conformiq Creator™, which enables an end-to-end automation process that starts with the creation of a model, which is a graphical description of the application being developed, using the requirements. Directly from the model, all functional test cases, documentation, and executable scripts are automatically generated without user involvement except to select the test design algorithms used.

The initial project work was done over a period of ten calendar days, with the goal of validating the required target capabilities through automating the design of test cases for execution and integration with the bank's existing SDLC tools infrastructure. Conformiq provided initial modeling of the NetWeaver SAP GUI for Windows for selected standard transaction types (including FB01 and FB08), as well as for the bank's own customized transactions. For the initial proof, a few standard transaction codes and sub-types were scoped to be tested. Also, for each transaction and type, a few application scenarios were selected, to cover positive and negative operations.

The bank's primary test execution tool was HP® UFT, and test scripts generated by Conformiq were integrated with the bank's flow. Readable reporting for testers and management in MS Excel was also included as a deliverable. Note that the SolMan SAP Solution Manager was not used by this bank, so

even though it delivers integration and management capability including pre-built standard test cases, it was therefore not included in this engagement.

The testing challenges and goals the bank wanted to address included speeding up testing time, accelerating project schedules, reducing testing effort and resources, improving test design productivity, achieving 100% requirement test coverage, knowing what was tested (or missed), automating and making visible requirements traceability, integrating with their existing SDLC flow, and generating custom test reports.

The bank's goals are shown in the following table. The Conformiq 360° Test Automation solution validated all goals during project delivery.

Goals	Validated
Faster testing time	√
Accelerated project schedules	√
Reduced testing effort and resources	√
Improved test design productivity	√
100% requirement test coverage	√
Known test coverage	√
Requirements traceability	√
Existing SDLC tool integration	√
Generation of custom test reports	√

Conformiq's Creator modeling software was used to graphically capture bank-specified SAP transactions and the system flow from requirements, then the Conformiq test generation engine automatically generated an optimal test suite to achieve 100% coverage of requirements including positive and negative test cases. To speed the process of test generation for real-world model size and complexity, the Conformiq engine automatically split the model across all available computation processors. Test case results were delivered for analysis via automatically generated test step reports, message sequence charts, test-to-requirements traceability matrix, and a graphical model coverage diagram.

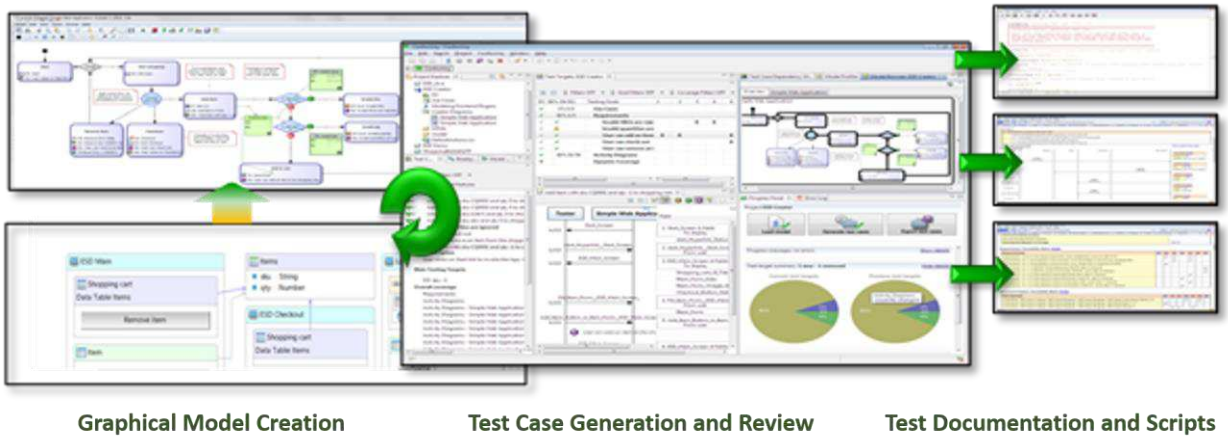

Figure 1: Three Step Process for Test Design

The three step process shown above highlights modeling, generated test case review, and test documentation plus test scripts for automated execution, including the expected correct test execution results (test oracle).

The SAP transaction cases this financial institution selected for testing with Conformiq Creator included:

- FB01 – Post Document
  - KR Transaction Type – Vendor Invoice Document with 8 scenarios
  - SA Transaction Type – G/L Account Document with 4 scenarios
  - DL Transaction Type – General Account Receivables with 4 scenarios
- FB08 – Reverse Document with 2 scenarios

Since there are a variety of different ways to model these operations, Conformiq chose to create 4 system models to represent these SAP system transactions. Regarding data, different data handling approaches are also supported by Conformiq. So some of the expected data was described in the model and some was handled with "place holders", allowing virtual data to be replaced with actual data in the automated execution system (in this case, HP UFT).

The SAP transaction codes in FB01 shared a common SAP GUI (screens, forms, fields, etc.), so Conformiq ensured consistency by developing a shared structure diagram between the various created models (with only minor adaptations to the baseline structure) to support all 3 transaction types in FB01: KR, SA and DL.

Note that model visualization enables an improved understanding of the requirements and expected operation. These models of the desired system operation are easily modified and updated whenever subsequent design changes are made. From these models, Conformiq tools automatically think of, optimize, and then generate test cases for execution.

The other models were developed and exercised similarly, with automatically-generated test cases for complete coverage. To summarize:

Model	Test Cases
Model 1 –WB FB01 – KR type	8 test cases, Conformiq generated 1 positive and 7 negative
Model 2 – WB FB01- SA type	4 test cases, Conformiq generated 1 positive and 3 negative
Model 3 – WB FB01 – DL type	5 test cases, Conformiq generated 1 positive and 4 negative
Model 4 – WB FB08	2 test cases, Conformiq generated 1 positive and 1 negative

Next, after the test cases were automatically generated, Conformiq was used to analyze and review test case completeness, to validate the correctness of the system model. Conformiq tools provide multiple test information views to accomplish this, building on and leveraging its Eclipse IDE platform.

Test coverage results were viewed against the test targets to ensure the coverage settings were properly selected. All models were checked to ensure full 100% coverage of the requirements.

Then, for test case export, the fact that Conformiq supports a wide variety of technologies and formats into which the automatically-generated test cases and related information can be exported, made connecting with the bank's customized testing platform very easy.

Based on the bank's request to use MS Excel for reporting, Conformiq automatically generated custom-formatted Excel reports for each of the 4 models, capable of being shared and reviewed with project management, business analysts and others, as well as used by the bank's project stakeholders. The test case output was customized to both of the bank's desired styles:

- MS Excel format for reporting
- HP ALM style for test case upload

Also, the bank requested test script export to HP UFT for automated test execution against their SAP GUI system under test (SUT). The bank used an SAP add-in to support object recognition for their special GUI. So**,** complete test cases generated by Conformiq, including test steps and data, were automatically exported in HP UFT format. Conformiq also generated an HP UFT Function Library (test harness.)

Project Results

This project was completed within a timeline of 10 calendar days in April, 2015. The program was completed much faster than by previous manual methods and required minimal bank resources. It was delivered by one Conformiq field applications engineer (FAE) on site and one dedicated bank SAP consultant.

The bank's main goal of automating test design was easily demonstrated by Conformiq's fully automatic generation of test cases, fast stimuli, and data, for 100% test coverage and correct test execution results as well as ease of adoption. For reporting and integration, Conformiq generated Excel files in the bank's preferred formats for reporting, as well as integration support for HP UFT with executable scripts.

The Conformiq 360° Test Automation solution and its associated tools received positive feedback from all of the bank staff stakeholders, including the test architects, testing team, and business management. Delivery times captured for test project activities are listed below. All model creation times include knowledge transfer time between the bank and Conformiq modelers, which made up most of the recorded time.

Activity	Time
1st model creation (FB01 – KR)	12 hours
1st model enhancements for negative scenarios (FB01 – KR)	8 hours
2nd model creation (FB08)	4 hours
3rd model creation (FB01 – DL)	3 hours
4th model creation (FB01 – SA)	2.5 hours
HP UFT set-up (one-time task)	4 hours
HP UFT object repository creation for 3 test cases from 1st model (FB01 – KR), including checkpoints (one-time task)	2 hours
HP UFT Function Library creation for SAP NetWeaver screens and objects (one-time task)	1 day
HP ALM integration set-up (one-time task)	1.5 hours
Generation of test cases from any model	Seconds

Test case export to documentation / Excel reports	Seconds
HP UFT test suite export	Seconds
HP UFT test case execution	30-60 seconds per test case

Previously, the bank had no automated test execution in place for SAP NetWeaver. Their test architects ran manual tests using HP UFT. The results from using Conformiq 360° Test Automation on this project have proven that Conformiq next-generation testing delivers major overall testing improvements.

Next Steps

Moving forward, the bank is focused on how Conformiq solutions can be extended to cover approximately 170 SAP Transaction Code types, as part of an end-to-end testing framework. The bank would like to build models to cover all of the 170 codes.

In addition, stakeholders at the bank identified several more SDLC integrations with two other tools the bank uses. Both of these are already supported, and Conformiq can easily demonstrate their integration:

- TestLink as another test management / execution platform.
- iGraphix BPM Software to create graphical activity diagrams.

In the project, some standard SAP negative scenarios were modeled, generated and executed. Although for standard SAP, negative scenarios are not required to be tested by the bank, it has also developed some custom SAP transactions. For these, the bank now wants to include negative scenarios into the testing process.

The bank plans to explore and understand how all of their test assets can be reused, and all tools leveraged, to accelerate modeling and testing through Conformiq 360° Test Automation.

Summary

Conformiq has helped this financial institution achieve its goals in automating test design, and is transforming their approach to software testing with Conformiq 360° Test Automation.

By adopting Conformiq, the bank demonstrated the value of automating test design with an end-to-end SDLC integrated process for faster software testing and lower testing costs, all with known quality and full documentation. The value is in moving away from their slow, expensive, risk-prone manual testing to fully automated test design.

Any company looking to improve its current testing methodology should consider the benefits that this transformational process will deliver. Conformiq and its testing service partners can help achieve success, and aid in the faster release of products and applications.

CONFORMIQ

Conformiq is transforming software testing with Conformiq 360° Test Automation™, providing the most sophisticated and comprehensive automated test design solution in the industry. The unique Conformiq 360° Test Automation technology enables the next generation of testing: transforming, streamlining and automating even the most complex system-level testing environments. Conformiq 360° Test Automation improves efficiency with a 40% faster test case development cycle; enables delivery of higher quality code with 50% more defects found; increases manageability with 50% better collaboration: and reduces costs with a 400% return on investment. Conformiq serves enterprise IT, communications and embedded software markets worldwide. Privately-held Conformiq is headquartered in San Jose, California, with a worldwide delivery and support organization including offices in Finland, Germany, Sweden, and India.

www.conformiq.com **sales@conformiq.com**

USA
4030 Moorpark Ave
San Jose, CA 95117
Tel: +1 408 898 2140
Fax: +1 408 725 8405

FINLAND
Westendintie 1
02160 Espoo
Tel: +358 10 286 6300
Fax: +358 10 286 6309

SWEDEN
Stureplan 4C
SE-11435 Stockholm
Tel: +46 852 500 222
Fax: +358 10 286 6309

GERMANY
Maximilianstrasse 35
80539 Munich
Tel: +49 89 89 659 275
Fax: +358 10 286 6309

INDIA
29 M.G. Road Ste 504
Bangalore 560 001
Tel: +91 80 4155 0994