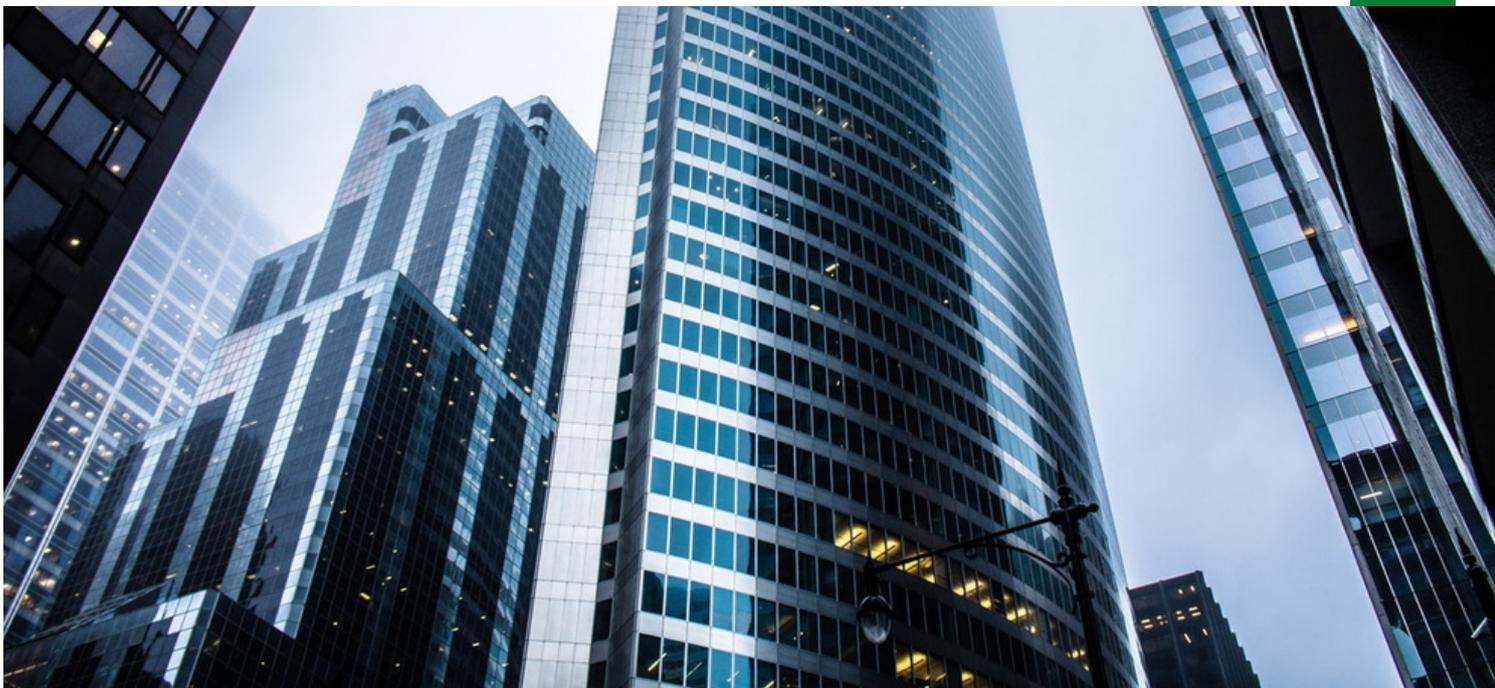# CONFORMIQ

SALESFORCE TEST AUTOMATION

How a Large Financial Institution Leveraged Test Design Automation For Salesforce Test Automation

About the Client

The client is a large Global financial institution headquartered in Toronto, Canada, providing services in the areas of Personal and Small Business Banking, Commercial Banking and Wealth Management and Capital Markets.

Business Objectives

The client was going through a corporate-wide major transformation where the business had to build and implement an enterprise wide CRM application to track customers and prospects. Furthermore, the business vision was to integrate the CRM platform into all Lines of Business to provide one common account of the customer's existing products and future products with an ultimate objective of generating new sales while decreasing administration costs.

Client Challenges

After deliberation and extensive research, the client chose Salesforce as the CRM platform for maintaining and tracking their customer information. The main challenge they faced was to build and implement Salesforce application in an agile environment with expanding and changing requirements under strict time deadlines. Since Salesforce is a cloud based and scalable platform, they were looking for an equally scalable testing solution to test powerful tool like Salesforce for omni-channel testing. Since the clients wanted to customize the Salesforce platform and leverage it for more than CRM, they were concerned about the Quality too, making Quality as the most important business objective. They primarily desired –

- Minimal to no manual tests
- Full integration into their Selenium automation framework so that they would go from test creation to automation in one step
- Support for Salesforce widgets
- Integration into their existing infrastructure including JIRA DC, MF ALM, TFS, GIT
- Ease of use by Quality Assurance and Automation framework
- Reduced overall time to generate test cases and test scripts
- Adaptable to agile environment with constantly changing/expanding requirements
- Ability to support complex application and workflows

They also faced some other testing challenges listed in Figure 1:

	Reason
Manual testing	Focus on limited # of Test Cases during dev cycle
Reports	Manual reports failed to cover success or failure of automates tests
Test coverage	Insufficient test coverage for changes in Salesforce and their cloud-based applications
Test execution process	Longer and slower manual test execution cycle
Testing costs	More resources were involved in manual processes increasing overall costs
Business platform	Current system not designed to handle heavier loads
Errors/defects	Repeated manual tests were prone to errors, decreasing productivity
User satisfaction	Low user satisfaction due to system failures

Figure 1: Client challenges around various testing processes

Our Approach

The project used a modified agile approach to continuously create application capabilities that satisfied the business needs of maintaining the customer information for sales. The most imperative ask was delivering quicker and comprehensive testing with known coverage and high quality with no critical issues at the end of delivery.

After significant evaluation of all test automation tools, Conformiq Creator was chosen.

This was primarily due to Creator's ability to model the Salesforce application and rapidly generate test cases to keep in sync with the agile deadlines. Creator is also capable of delivering the optimized automated test cases directly for their in-house Selenium web execution platform as executable test scripts for Salesforce.
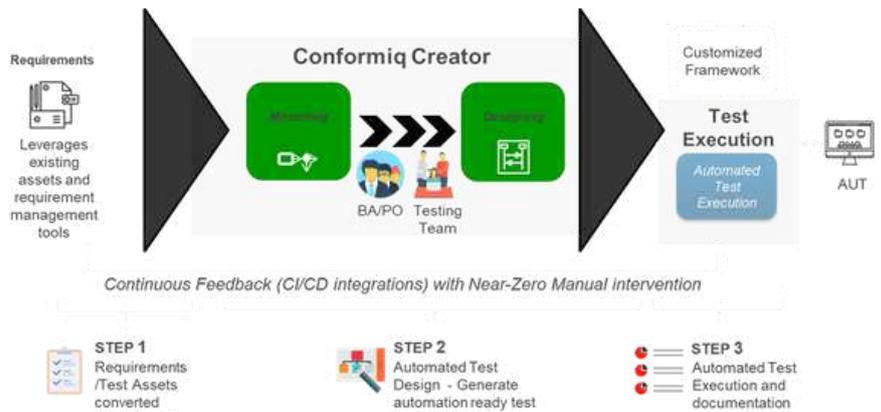

Figure 2: Conformiq Creator architecture

The Solution

Conformiq Creator was extensively used by on-shore and off-shore teams to build a common model to meet testing requirements for each sprint. Creator then generates optimized test cases as well as an output file that feeds into their automation framework. The testing teams were able to quickly create the test cases for each sprint in a timely manner and passed into their in-house automation framework for one click execution. Creator was also successfully integrated into their Micro Focus ALM and JIRA Data Center environments for Test Management and Defect Management processes respectively.
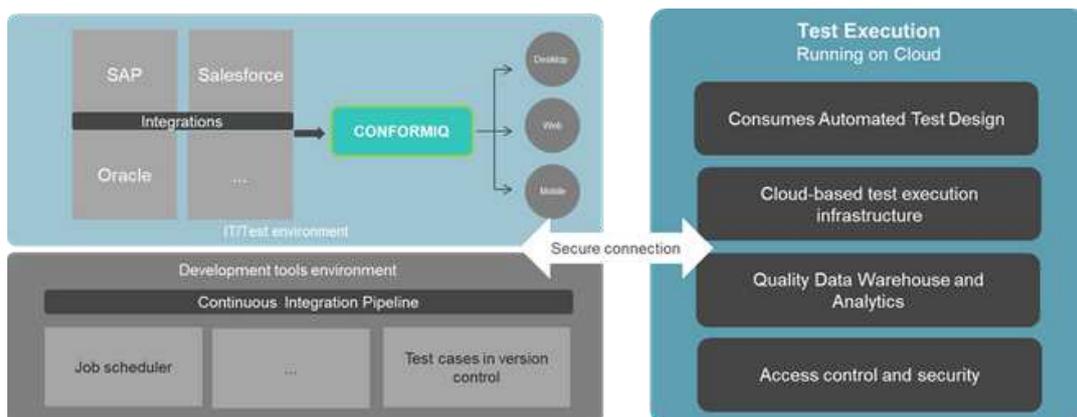

Figure 3: Integration of Conformiq Creator with client IT landscape

The solution works in three simple steps:

Step 1:

Conformiq Creator captures the business requirements in the form of business flow and generates structural and activity diagrams for ease of business users. The below activity diagram was created by creating flows of the application logic, specifying activity nodes based on interactions with the application under test, i.e., by dragging & dropping in input or verification actions from the imported Salesforce application interface, and splitting flows based on data injected by input actions.

The Creator test generation engine then understood and analyzed the flow and actions against the linked test data then used the user selected test optimization method to generate the optimized number of tests that cover all the application included in the model – both the positive and the negative test case flows. This ensured complete test coverage and, with the reporting tools with in Creator, the coverage of each test case was shown as a highlighted path through the activity diagram. Also shown was the traceability matrix so each test case was linked with the requirement(s) it covered.
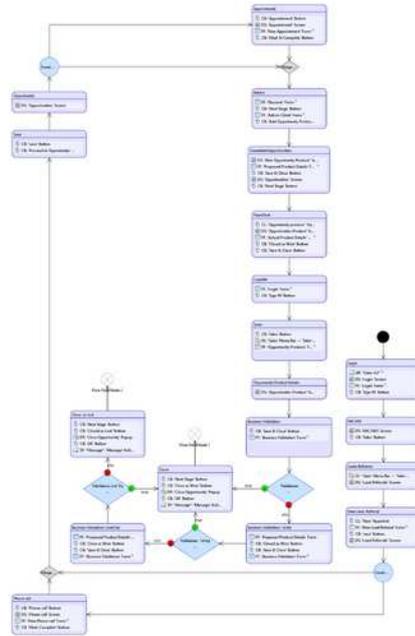
Figure 4: A Salesforce model generated in Conformiq Creator

Step 2:

Once the test cases are generated, testing teams review the generated test cases to verify the output. The next step is to automatically generate the test scripts with validations directly for automatic execution with the customer's custom test execution framework. A sample screenshot is shown in the below image. This capability makes Creator unlike any other tool and delivered huge time and efficiency savings (as all other tools only generate the test cases for manual execution and testers must write the code snippets for execution along with determining their test validations). This is where the DevOps tool chain breaks down and Creator is uniquely able to bridge this gap and enable test execution automation fast enough to enable a continuous CI/CD process. This enablement of direct automated test execution created huge time savings for the project.

Figure 5: A sampling of generated test cases

Step 3:

The automatically generated test scripts are then fed into the client's customized in-house test execution framework for automated execution.

Client Benefits

Based on the initial result, the client's testing project created over 8900 test cases in all combination mode, providing full coverage in a matter of weeks. This resulted in reduction in effort by ~60%. Additionally, they witnessed 3x productivity gains over manual testing projects.

Creator's ability to model the Salesforce application were viewed as a USP and helped meet the testing releases on time.

Some other Creator's USP that acted as an advantage to FastTrack the delivery cycles were:

- Scalable Architecture to support DevOps/CICD pipeline
- Intelligent Test Design Automation
- Requirement as the single source of truth
- Automated Test Optimization
- Change Impact Analysis

Finally, the benefits witnesses by client's testing team in the various testing processes are listed below:

	Benefit
Manual testing	Reallocated the time and effort of on manual tests such as risk analysis or exploratory testing
Reports	Automated reports showing which area need faster speed and attention
Test coverage	Execution of 100 of test cases with application compatibility with detailed coverages within the system
Test execution process	Integrated E2E automation increased test execution speed and efficiency from weeks to hours
Testing costs	After automated test scripts are ready, resources were leveraged efficiently, thereby reducing testing costs
Business platform	Salesforce automation creates a scalable architecture for delivering business objectives at a faster rate
Errors/defects	With flawless automated test cases and execution, the team received accurate testing results
User satisfaction	Early-on detection of system failures and fixes led to higher internal and external user satisfaction

Figure 5: Client benefits using Conformiq Creator