



CUSTOMER SUCCESS STORY

THE LARGEST TELECOM PROVIDER USES AUTOMATED TEST DESIGN TO SPEED TIME-TO-MARKET FOR MOBILE AND MULTI-PLATFORM APP

ABOUT THE CLIENT

The client is the world's largest telecommunications company and the largest provider of fixed telephone services in the United States. The services include mobile, broadband, video and other communications services to U.S. based individuals and businesses.

PROJECT BACKGROUND

Driven by intense time to market demands for releasing new products & services, the client's testing organization explored options for improving the speed and effectiveness of their application testing methods. In the highly competitive telecom service provider market, innovation is the key to new customers and expanded profits. New products, combinations, and capabilities drive new business and if the provider is not delivering these services, their competitors will, resulting in the loss of millions of dollars every month that they are delayed in releasing products. Therefore, any bottleneck in the end-to-end product delivery process needed to be identified and removed.

BUSINESS OBJECTIVES

One of the client's new product deliveries included a web and mobile interface for end customers, so that customers could monitor and update their own accounts. The company needed to implement a testing improvement plan, which would allow for faster test case creation without sacrificing any test coverage. This was important to support their many revisions each year required to quickly add new services. It is simple to speed test creation if comprehensive and known coverage isn't really needed, but thorough known coverage was critical. Any error in configuring the end user selected product combinations or account reporting or any new product provisioning mistakes could prove to be a nightmare for customer relations.



OUR APPROACH

Working with the client's testing services partner, Conformiq presented its Automated Test Design (ATD) approach based on Model Based Testing (MBT) as a testing transformation to greatly improve the current manual test design process. Even though Conformiq's solution was designed to fit completely into their existing SDLC environment, including a customized reporting format that they needed to continue using, extensive proof was still needed to overcome concerns about the capabilities, flexibility and scalability to actually deliver to their exacting needs with this transformational process.



THE SOLUTION

Conformiq Creator is a test automation solution that enables an end to end process starting with the creation of a model which is a graphical description of the application being developed using the requirements. From the model, all functional test cases, documentation, and executable scripts with their validations are automatically generated.

The project work was done over a period of two weeks with the goal to demonstrate sufficient efficiency gains in test design to justify the transformational change from manual to automated test design. Speed up in automating the execution would be a bonus. As the proof, four programs were selected, split between GUI and mobile applications, each with a different set of test design issues, so the full capability of the automated test design process could be validated. Two medium and two complex applications, as determined by current test management, were chosen.

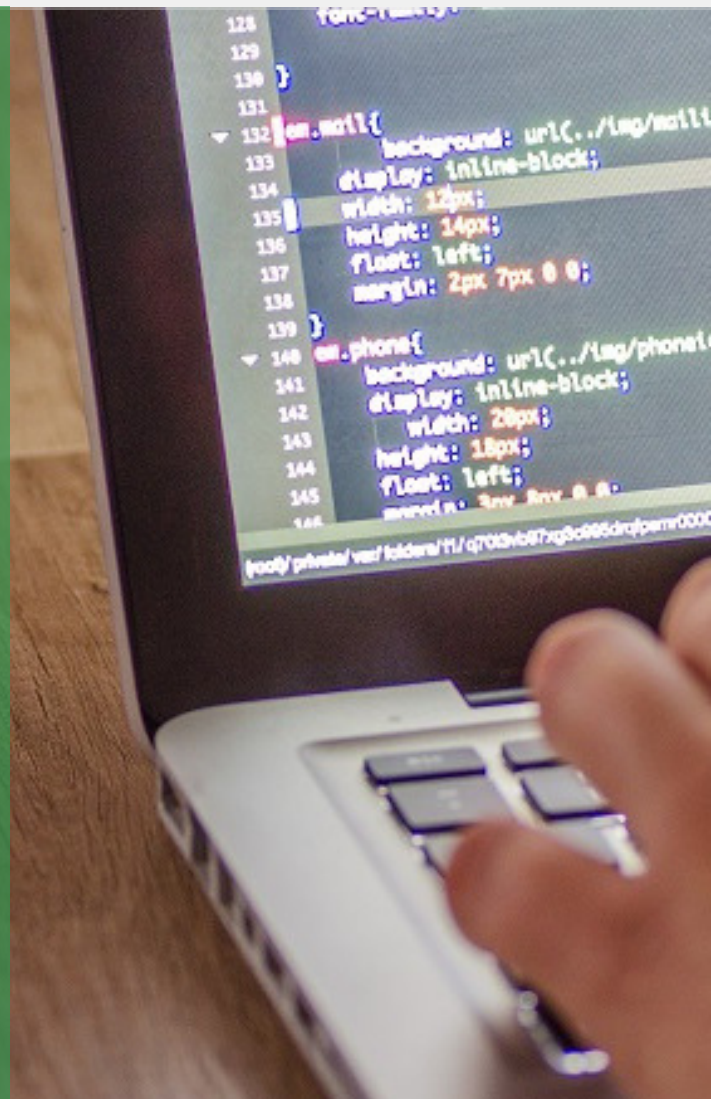
A seamless end to end automated testing process was demonstrated. It started from system requirements through to interfacing with Selenium, Selendroid and Appium automated test execution harnesses, and tested the correct and equivalent operation of the end user account access application through the GUI user interface as well as on Chrome, Internet Explorer, and Mozilla mobile interfaces.

The Conformiq Creator modeling software was used to capture the application operation and system flow from the requirements. Mismatches between requirements and the model were automatically flagged. The model was reviewed and, as it was graphical, logical process errors were easily and quickly identified. Appropriate data was included to drive the automatically generated positive and negative test cases.

As previously stated, the primary improvement needed was the ability to speed up testing when application changes are made. The client had nine application design enhancements per year and there just wasn't enough time to write comprehensive test cases for every change, yet high quality was a given requirement. The initial Creator test design times proved to be fast enough that the testing partner recognized the ATD process could be used on every change to get comprehensive testing done in time. With everyone's understanding that once modeled, changes to the model would generate tests even faster, there was no need to actually demonstrate how quickly test cases can be regenerated after design changes for greater efficiency gains.

If Conformiq Creator's update capability had been demonstrated, the existing test cases would have been automatically updated with every model change, including notification on which new ones were added and which were no longer valid, so the invalid test cases would not be carried forward to create a bloated regression suite.

The process of modeling, generated test case review, and then test documentation, plus test scripts for automated execution, including the expected correct test execution results (test oracle), is shown in three steps on the next page (Figure.1). Incremental modeling and test generation supports agile processes and continuous integration with tools like Jenkins.

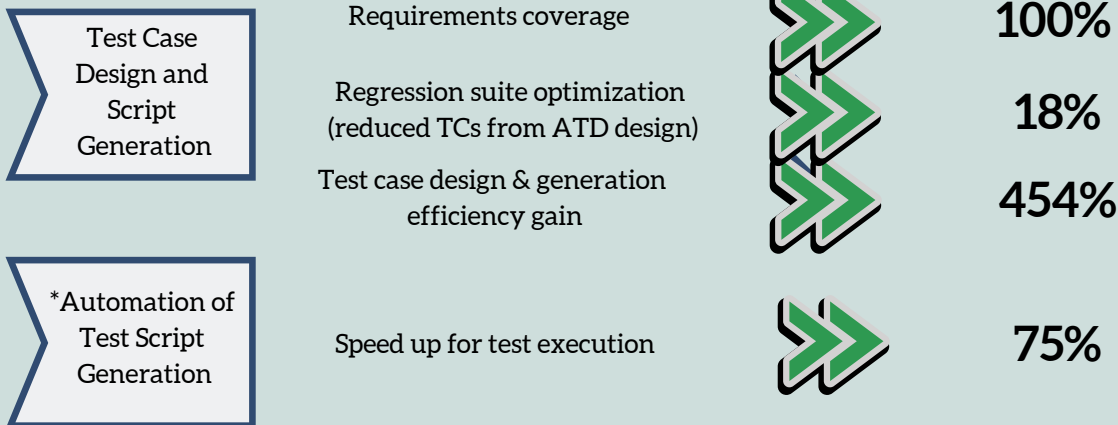


CLIENT BENEFITS

Once modeled in part, the Conformiq test generation engine automatically generated an optimal test suite based on the user selected test design algorithms to achieve 100% coverage of the included requirements. These results were analyzed by reviewing the generated test step reports, message sequence charts, test-to-requirements traceability matrix, and the graphical model coverage diagram. The Conformiq engine automatically split the model across all available computation processors speeding the test generation for real world model size and complexity. Once validated, the model was extended for additional features, and scripts for Selenium, Selendroid, and Appium were generated for execution.

As the company's goals for this project were test design speed, the client's previous manual times and efforts to complete the test case designs were known and were matched against the Conformiq generated results. The client's key target of increased test design speed was easily demonstrated by Creator. Additionally, Creator automatically generated the test execution stimuli and expected correct test execution results plus an Excel mapping file with pre-defined library mappings, which easily linked the executable scripts with the harness. This allowed the client company to achieve an automated end to end testing process and further efficiency gains. Because Creator automatically provides impact analysis after each model change, maintenance would be improved since the no longer valid test cases wouldn't be carried further for execution. Additionally, like all projects, they wanted documentation in their own reporting format and the Conformiq scripiter was quickly modified so documentation was generated in their format.

The overall results for the testing work done for these four projects combined were as follows:



*Test automation achieved by generating executable scripts linked to harness library functions

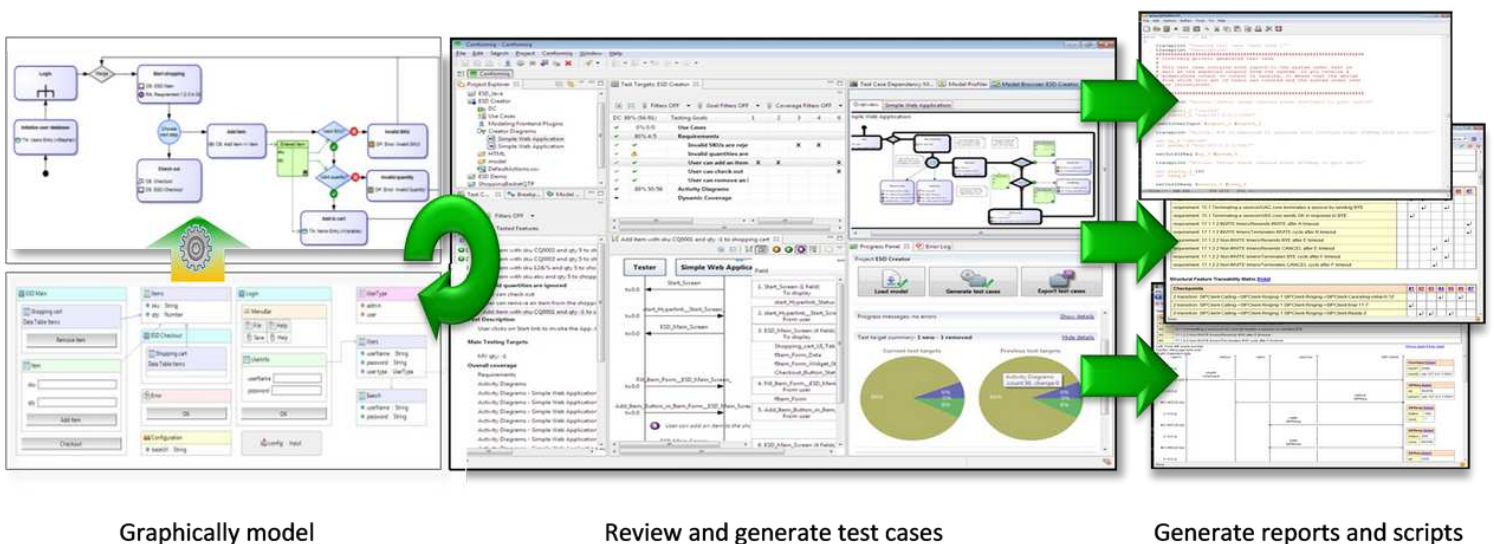


Figure 1

SUMMARY

The client company and their testing partner more than achieved their initial goal of speeding up test design. They also realized an unexpected efficiency gain. They found that using Creator provided them with consistent tests that made test review by stakeholders and test execution much easier. They achieved a dramatic test design efficiency gain and an end to end SDLC integrated process that will enable them to fully test 9 revisions each year. Additionally, the speed up in test design and execution will result in lower testing costs for the testing provider and thereby increase their EBITA.

MBT is an umbrella term that can mean many different processes built on the concept of using a model. The differences between MBT tools are very large and, even though they are similar in their high level abstract concept, the details from projects such as the one for this telecom company and their testing services company prove that the right MBT tool can provide great transformational improvement - benefits much greater than just faster test design. To deliver the highest level of overall capability through the MBT process, Conformiq delivers an integrated yet open end to end automated testing process to be integrated with third-party SDLC tools and/or the testing partner's or customer's own tooling. Even though the gains achieved from deploying the Conformiq MBT based Automated Test Design process are significant, the larger gain comes from commercial deployment of the developed application sooner.

Conformiq's Automated Test Design is the most advanced test automation process. All organizations looking to improve their current functional testing would do well to look in depth at what this process change will deliver. Conformiq and its testing service partners can help achieve a successful transformation.