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Make Technology Work

TEST AUTOMATION SOLUTION FOR SALESFORCE APPLICATION

PROJECT OVERVIEW

The application is a tailored Salesforce platform for enterprise requirements: Lead Generation and Purchase Order creation workflows across financial services modules (Personal loans, Insurance and B2B Services)

SOLUTION DELIVERED

Test Automation

CLIENT DOMAIN

Financial Services

KEY HIGHLIGHTS

A Salesforce CRM tailored for Financial Services Business requirements and integrated with intensive enterprise data necessitated end-to-end QA across Web and Mobile platforms.

Indium Software addressed the QA needs by fragmenting Test Automation Solution in different layers

- Functional Coverage with custom automation framework (iSAFE)
- Test Data Generation in a jiffy
- Advanced configurations for mobile platform code maintenance
- Utility-based solutions for debugging the instrumented iOS application

ABOUT CLIENT

Our client is a Financial Services provider with assets and operations competitively expanding across geographies. The company uses Salesforce to benefit from processing applications aggressively and scale up acquisition business. Sales dealers are connected on Salesforce using self-service features on their mobiles, typically, to manage sales leads, track opportunities and orders, maintain customer information.

BUSINESS CHALLENGES

- Complex instrumentation of the application.
  - Demands in Web & Mobile synchronization.
  - No access to developer profile enabled build for iOS version.
- Data intensive functionality: Simulate real time records of sales data. For instance: lead generation records with over 80 fields of details for each sales lead.
- Test Coverage for Image based functions – Scenarios that include capturing and uploading a sales lead's picture / capture digital signature to be accounted in the automation scope.

BUSINESS REQUIREMENTS

- Automate Testing for the given workflows on Web and Mobile (Android and iOS) applications to reduce time, cost and inconsistencies.
- Streamline QA Process: Utilize inputs from the in-house functional test results and optimize Automation Testing scope.
- Transform the Test Cycle by using a framework that blends with Salesforce platform, supports integration and has extensive test reporting abilities.
- Active Script/Code Maintenance.

SOLUTION HIGHLIGHTS

Indium Software's QA experts analyzed the application workflows to derive the Process and Technology needs to automate functional QA and accelerate Test Cycle.

Technology Stack

- Application Development stack: HTML5, Android Native, iOS Native, SQL & SQLite (for mobile offline data store), JAVA APIs.
- Automation QA Stack: Selenium, Java, Appium, Java Client Library for mobile interactions.

QA Standardization: The case of QA Process Streamlining

The QA set up was required to be standardized in terms of producing Test Artefacts and Reports from the Functional Testing unit that would clearly assist in proposing Test Strategy for Automation.

- Indium Software Test Automation Team participated in Knowledge Transition and Brainstorming Sessions with the client to feed the Test Artefacts and Reports in standard templates.
- The Process Streamlining exercise led to future Requirement Traceability, Visibility and served as a back of the mind input to derive test scenarios for Automation Scope.
- Created Test Case estimates based on the Test Artefacts and the effort continuously optimized.

Test Automation Solution with iSAFE Framework

iSAFE – Indium Software's advanced automation framework for accelerating test cycles was employed to cater to the Test Automation Solution for the Salesforce Application. iSAFE integrates well with standard Automation Tools, enables parallel execution of Test Cases and keeps maintenance costs of Test Scripts and Test Data in strict check!

Test Data Generator: A smart utility for real time Test Data generation at scale

Owing to the data intensive nature of the Salesforce app functionality, Test Data generation was an exhaustive process. Data consumed for a test execution is one-time and cannot be reused for multiple instances posing a challenge for regression suite or periodic builds

- Test Data Generator, a utility function that uses Java and Regular Expressions was utilized to simulate exact test data formats and comply to business rules.

- Test Data Generator creates unique data for test execution, is reusable and consistent.
- This auto generated test data is set to be consumed by the iSAFE framework in run time.

Test Coverage:

- An end-to-end run through of application workflow was to be covered for automation and validation of all input fields across use cases / functionality.
- The artefacts created for Functional test cases covered all available end-to-end flows and functional use cases. We achieved almost 90% of application's GUI elements and functionalities covered.

Web and Mobile Synchronization:

The lead creation and management workflows, access and modify actions in the Salesforce platform, is an omni-channel experience feature. A typical case would be to create a lead on the web application with all required fields and a sales dealer would approve a lead on the mobile self-service portal or vice versa. QA needs for the different web and mobile combinations (possible business scenarios) were to be addressed as a special functional coverage

- Our solution included iSAFE customization that synchronizes a record created in back office account and validate or update the same on the client-side application (Mobile/Web).
- iSAFE initializes multiple Browser/Mobile Application instances in parallel or on demand. This helps a (current) test scenario to interact with more than one application inside same test case.

Built-in Analytics with iSAFE

- Provided real time reports on Test Execution status and outcomes that allowed Dev Teams to schedule agile actions on the test results.

UAT Automation: Catalyzed Test Cycles with shorter paths to Test Script Maintenance

- UAT Automation Solution features auto generation of scripts from record and play back translated into any testing framework, auto fix scripts with feature changes, import and run anytime.
- Recorded end to end 9 major workflows, covering greater than 90% of the UI Objects.
- The workflows were exported into iSAFE format, broken down into reusable functions.

Extended Test Coverage: Efficient Script Maintenance and Automation Coverage for Instrumented Mobile Application

- With iSAFE framework as the base, Object Repositories for iOS and Android are created, maintained and updated dynamically in a common code environment.
- Separate scripts for UAT and ear-to- Production releases for easy regression.
- Changes are handled at functional and framework levels – the slack in Object Repository maintenance is sorted with great efficiency.
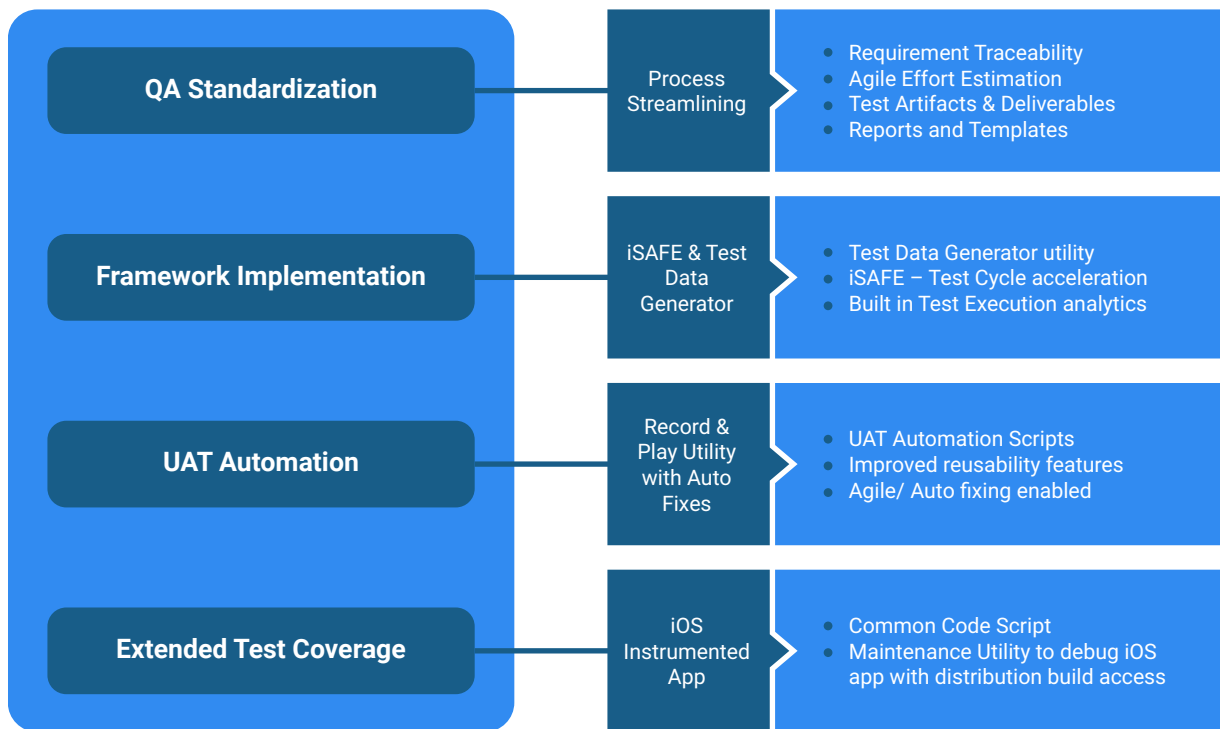
BUSINESS IMPACT

- Rapid Regression and Continuous Testing enabled using Test Data Generator Utility. The effort to generate Test Data for 100 rows would require a painstaking 4 man-hours which was automated to almost 30 seconds at one click action (nearly 100% reduction in manual effort).
- Reduced overall error rate in manual test data generation.
- Record results in productivity in delivering about 900 test cases in 40 Calendar days, with 10-member team .
- Robust framework to customize test components to suite the app needs and continuously optimize the Test Operations.
- 2X improved efficiency in scripting effort and code maintenance (Android and iOS).
- Supported rapid delivery cycle. Upto 40% improvement in overall Test Automation process.
- Extensive Reporting/ Dashboards to give a 360-degree status of Test Execution and Operations.

TECH STACK

iSAFE Automation Framework,

Selenium based Test Automation,

Utilities for Test Data Generation and

iOS Debug with Appium

Indium Software developed a utility that debugs iOS application with help of Appium in view of the limitations in access to the Developer Profile Enabled build

QA Standardization	Process Streamlining	• Requirement Traceability • Agile Effort Estimation • Test Artifacts & Deliverables • Reports and Templates
Framework Implementation	iSAFE & Test Data Generator	• Test Data Generator utility • iSAFE – Test Cycle acceleration • Built in Test Execution analytics
UAT Automation	Record & Play Utility with Auto Fixes	• UAT Automation Scripts • Improved reusability features • Agile/ Auto fixing enabled
Extended Test Coverage	iOS Instrumented App	• Common Code Script • Maintenance Utility to debug iOS app with distribution build access

ABOUT INDIUM

Indium is a Digital Engineering Services leader and Full Spectrum Integrator that helps customers embrace and navigate the Cloud-native world with Certainty. With deep expertise across Applications, Data & Analytics, AI, DevOps, Security and Digital Assurance we "Make technology work" and accelerate business value, while adding scale and velocity to customer's digital journey on AWS.

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