



## Case Study

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# Test Automation in Agile Environment using Selenium Webdriver 2.0

(Selenium 2.0,Php, MySQL, Apache)

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**Your company information**

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<b>Solution group</b>	Testing Services Group
<b>Solution offering</b>	Automation Framework Setup and Regression Testing using Selenium Webdriver 2.0
<b>Project name or title</b>	Test Automation in Agile Environment using Selenium Webdriver 2.0

## Client profile

Client is an Australian retail financial services group with operations spanning all mainland capital cities and major regional centers throughout Australia. In Home loans domain, company introduced the securitization of home loans, allowing them to offer loans upwards of 3% cheaper than its competitors making them market leaders in their segment. Company's accredited mortgage brokers represent 18 home loan brands, including all four major Australian banks, and also offer their own suite of loan products including home loans, personal loans, credit cards and insurance

## Business and Technical situation

The system in question is a web based CRM application developed for the client. It brokers loan products funded by other financial institutions. Affiliated Mortgage Brokers across Australia use this system to identify the right loan product based on the customer's specific needs and preferences. After validating the application against rules defined by the funder of the product, system submits the Online Mortgage Loan Application. The system is designed to replace numerous legacy systems while integrating the ones that are irreplaceable.

AdactIn was involved in development of an automated test harness for a Web Based Application developed in an Agile (Scrum) environment having a two weeks sprint cycle. Initially scope of automation was confined only to a regression suite, testing the product delivered after every sprint. However, the stakeholders immediately identified the benefits of automation and expanded the scope to end-to-end testing with different datasets, Data Migration Testing, Cross Browser, Cross Platform Testing and User Acceptance Testing.

## Solution

### Phase 1 - Knowledge Transfer and Requirement Analysis

- The AdactIn team comprising a Team Lead and 2 Test Analysts initially spent time with Business Analysts (BA) and Subject Matter Experts (SME) to understand the system, end to end business processes and testing requirements of the application.
- Delivered presentations to the stakeholders on Automation process and techniques.
- Assisted in short listing Valued Automation Candidates (VACs) on the basis of effort and return of investment (ROI).

### Phase 2 - Test Planning and high level Test Case Design

- Implemented Hybrid Framework for the client with features like:
  - Keyword driven approach to maximize reusability.
  - Data Driven approach to test functionality with different sets of data.
  - Custom Reporting with both web and spreadsheet format.
  - Automatic mail delivery of Execution Report on completion.

- Loaded with OOPS features for Dynamic Dispatch, Polymorphism and Inheritance.
- Auto data generators for unique names and numbers.
- Yet designed to be utilized by non technical testers.
- Demonstrated a proof of concept covering one key VAC.
- Finalized automation scope considering VACs, Business Priority and client requirements.
- Formulated Automation Test Plan and schedule.

### Phase 3 - Scripting

- Designed and created reusable components.
- Created input data files.
- Coupled reusable components to formulate various test cases.
- Understood complex formulae and scenarios that performed calculations. Put a system in place to verify these calculations in every business scenario tested, leading to high quality product testing.
- Designed WAMP based PHP and Mysql utility to store results for future reference

### Phase 4 - Test Execution

- Team executed all developed test scripts for every sprint delivery and updated Status Report to coincide with Manual Test Cycles.
- Analysed Execution Report to identify defects and logged these in JIRA for defect tracking
- Script maintenance.
- Liaised with development team for fixes and retesting the fixed issues.

### Phase 5 – Documentation and Handover

- Documentation on the design of, usage of, and dependencies for, each script.
- Developed ROI Sheet for stakeholder to highlight Automation benefits.
- Assisted UAT by providing data input files and execution of required scenarios.
- Trained non technical team for the use of framework and scripts.

## Challenges Involved

- **High script maintenance:** Since, the Product development followed agile methodology therefore, automation involved script maintenance due to User Interface changes with every sprint. Foreseeing this, framework was designed to have a centrally located Object references file which could be updated as and when required.

- **Poor/ Variable Response Times:** The variance in application response time hugely affected script executions. In order to combat this problem, the team introduced dynamic wait functions to the script and used global variables which could be controlled centrally to change as per response time.

## Benefits

Find below snapshot of effort return on Investment sheet for the client

Automation Suite	No. of Scenarios Tested	Manual Regression Effort Days/Sprint	Automation Execution Effort Days/Sprint	Effort Saved Days/Sprint	Total No of Sprints of execution	Total Effort Saved (Man days)
Business Process A	200	15	0.5	14.5	18	261
Business Process B	40	5	0.5	4.5	18	81
Business Process C	200	15	0.5	14.5	17	246.5
Data Creation/Utility Scripts	20	8	0.5	7.5	18	135
Calc Verification Scenarios A	114	7	0.5	6.5	13	84.5
Calc Verification Scenarios B	125	10	0.5	9.5	13	123.5
Calc Verification Scenarios C	30	5	0.5	4.5	13	58.5
End to End XML verification	700	170	2	168	6	1008
Remaining Functional Tests	50	5	0.5	4.5	10	45
Data Migration Test	50	10	2	8	5	40
UAT Test Scenarios	500	40	2	38	2	76
<b>Total Test Conditions</b>	<b>1479</b>	<b>290</b>	<b>10</b>	<b>280</b>		<b>2159</b>

- 280 Man days of effort saved per sprint
- Overall effort of 2159 man days (9 man years effort) saved
- More than 100+ bugs found in regression testing using automation
- Reduced testing time to delivery by more than 2 weeks per sprint which was huge considering project was on Agile Methodology
- Data Migration team tested their data for more than 100000 records using automation scripts
- UAT Test team used automation scripts for data creation
- Entire automation effort was well received by client team and provided huge value to the end quality of the project

## Products and services we used

- OS – Windows2007
- Database – MySQL
- Language – Java
- Automation Testing Tools – Selenium 2.0, Firebug, FirePath

## Assistance provided by client resources

- Knowledge transfer on application workflows
- Access to existing test harness which should be used for automation

## For More Information

- For more information about Adactin products and services, call us at +61-420883561 or +61- (02) 8677-3409
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