Test Automation POC

AsureQuality

*Author – Sunjeet Khokhar, Test Lead*

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# Test Automation POC

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| VERSION | AUTHOR | CHANGES |
| 1.0 | Sunjeet Khokhar | Report based on the POC and demo to the JMS Team |

|  |  |  |
| --- | --- | --- |
| CIRCULATION | POSITION | email address |
| Tracey Buckley | Senior Business Analyst | [tracey.buckley@asurequality.com](mailto:tracey.buckley@asurequality.com) |
| Paul Theyers | Principal Consultant | [paul.theyers@assurity.co.nz](mailto:paul.theyers@assurity.co.nz) |

|  |  |  |
| --- | --- | --- |
| CLIENT DELIVERY MANAGER | POSITION | Signed |
|  |  |  |
| Date | ….. / .…. / .…. |  |

|  |  |  |
| --- | --- | --- |
| ASSURITY DELIVERY MANAGER | POSITION | Signed |
| Damian Brown | South Island General Manager |  |
| Date | ….. / .…. / .…. |  |

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# Objectives of Document

* To summarize the approach and findings of the Test automation POC for AsureQuality
* To recommend a Test automation tool for AsureQuality
* To articulate a path forward to implement Test automation at AsureQuality.

# Purpose of Automation POC

Assurity Consulting has executed a proof of concept on Test automation as part of the current engagement between AsureQuality and Assurity for the JMS project.

The objective of the POC was to use a range of test automation tools (from both the Open source and commercial domains) to,

* Assess suitability of AsureQuality existing suite of applications and MS Dynamics CRM platform for automation
* Propose an approach and better practices for implementing automated tests
* Recommend an automated test tool set to implement and deliver on the proposed approach

# Approach and Technical Findings

## Test approach adopted during the POC

1. GUI driven approach, use the tool set to recognize application’s UI elements and store them in the tool’s object repository
2. Script an end user scenario using the tool
3. Playback the end user scenario to prove feasibility
4. Refactor test script to “variable-ize” the script, attach data source for looping (e.g. username and passwords)
5. Add validation logic and implement pass/fail criteria for the test
6. Re-run and test the test for both pass and fail conditions to ensure test robustness

## 

## Tool sets considered initially

1. Open source - Selenium Web driver (using Ruby programming language), Watir (using Ruby programming language)
2. Commercial – Smart Bear Test Complete, Ranorex Test studio, WinAutomation

## 

## Tool sets demonstrated to the JMS Team

Out of the commercial tool set Ranorex was the most consistent in terms of application object recognition, out of the box feature set and stability of tests

Out of the open source - Selenium web driver was selected based on its better open source community support than Watir.

## Feasibility outcome

So far, the following applications have been assessed for automation:

* Qualcheck
* AuditTrax
* AQMC
* MS Dynamics CRM

**Qualcheck, AuditTrax and Dynamics CRM were successfully automatable** and a basic set of automated scripts and automatic validation demonstrated to the JMS Team.

**AQMC has been proven not to be automatable** with the set of tools used in the POC. None of the tools proved able to detect the various UI controls on AQMC hence they were unable to manipulate and automate manual workflows. The failure was demonstrated during the demo.

An alternate approach was executed for AQMC, i.e. to detect screenshots of the AQMC application and directing the tool to drive AQMC by matching the screenshots with a live application and clicking on relative positions on the UI. But as expected , this approach was extremely flaky as even a small change in the UI e.g. change in the job text or increase in number of jobs in the job list threw the tests off as the screenshot would not match with the actual application.

## Feasible Tool Comparative Analysis

|  |  |
| --- | --- |
| **Open source - Selenium Web driver API with Ruby programming language** | **Commercial tool - Ranorex Studio** |
| * Can automated web apps only | * Web, Desktop & Mobile apps |
| * Extensive language support. Java, C#, Ruby, Python * Open source ecosystem | * Only support C# and VB .NET * No vendor proprietary language |
| * Extensive Unit testing integration possible | * Only supports NUnit (.NET based unit testing framework) |
| * No user friendly UI. Completely a command line driven tool set | * A rich UI, offering a wide range of UI actions & validation controls. |
| * Must have a programming background to start adding value | * No programming experience required. - But basic training (online tutorials) of the tool is required |
| * Integration with source control & CI engine needs to be configured & maintained | * Integration with source control & CI engine needs to be configured & maintained |
| * No dedicated tooling support. Completely community based (however Selenium has a strong & dedicated community support since 2003 and is a W3C web standard since 2014) | * Dedicated vendor support , comes bundled in the licence |
| * Need knowledge of DOM (Document object model) to understand & manipulate Web elements. * Does not have inbuilt support for XPATH editing (need external tool) | * Need knowledge of DOM to understand & manipulate Web elements, however it comes with an inbuilt Objective recognition library and XPATH editor |

## Key considerations

These are the critical technical and commercial constraints that organisational leadership Teams must be cognizant of as they adopt Test automation in their organisation

1. Test automation is not just a record & play one time silver bullet to reducing testing effort.

It has an ongoing maintenance, debugging and analysis cost, just like maintaining application software code or IT maintenance of applications and systems.

1. Teams successful with Test automation need dedicated sapient & infrastructure resources to maintain, extend and write new Test suites and maintain existing automated tests over time

It is a parallel discipline to Software development and functional testing, with a FTE cost to the project/IT department.

1. Test automation has structure implications. Contemporary enterprise IT Teams have dedicated Test automators in their cross functional Teams who are responsible for,

* Delivering & maintaining regression scripts for existing AQ products & apps
* Writing new automated solutions (to go hand in hand with new project deliverables)
* Mentoring and upskilling other Team members on Test automation

# Recommended tool set for Test automation

Assurity recommend that AsureQuality look to **Ranorex studio** for the AsureQuality legacy and upcoming (Dynamics CRM) application stack.

The key influencing factors in Ranorex’s favour are -

1. Support for Desktop and Mobile applications in addition to Web. Selenium web driver only supports web applications.
2. Selenium web driver has a prerequisite of intermediate to advanced working knowledge of a programming language and object oriented programming (OOP) principles. Whereas Ranorex with its extensive out of the box feature set does not require any programming knowledge for business users and relatively non-technical testers to start adding automated testing value from Day 1.

*This has been further vindicated through feedback from the JMS Team in the demo.*

1. On top of the out of the box features , Ranorex also has tremendous flexibility to add custom code (in C# and VB.NET) to test suites that help in adoption of the tool with Developers and experienced Automation engineers

# Licence Pricing

The following tables outlines the licencing costs and options available for Ranorex

## Options

|  |  |  |
| --- | --- | --- |
| **Licence** | **Description** | **Cost (USD)** |
| Life time node locked licence | perpetual but locked to a physical machine | $2600.00 |
| Life time floating licence | Maintenance (new fixes etc.) and tech support bundled in the licence for the first year | $4500.00 |

## Renewal Cost

|  |  |
| --- | --- |
| **Licence (P.A.)** | **Cost (USD)** |
| Life time node locked licence | $500.00 |
| Life time floating licence | $890.00 |

# Better Test automation practices

* Just like application code automated scripts should be peer reviewed
* Change must managed through a distributed source control
* Automation endeavour must be driven through business and BA input
* Never use hard codes sleep/wait time in your tests to cope with latency in the application. Use explicit waiting for elements
* Structure tests as set up, execute and tear-down methods
* Have dedicated infrastructure, user accounts and environments for Test automation

# Next Steps

Assurity welcomes feedback on this report and looks forward to the opportunity to continue to work with AsureQuality on this initiative.

The following are a list of suggested next steps:

1. Demonstrate Ranorex studio to stakeholders outside the JMS Team (e.g. Arna Stevenson in the CRM Team).
2. Solicit feedback from JMS Team on whether there are other internal or customer facing applications that can be assessed for Test automation, outside the JMS project
3. Establish size and scope of regression test suites for MS Dynamics CRM
4. Articulate effort including cost of licensing and cost of effort to implement regression test suites
5. Present SOW for approval

Key Assurity contacts for this piece of work are:

|  |  |
| --- | --- |
| Sunjeet Khokhar  Test Lead  Assurity  021 154 5004  [sunjeet.khokhar@assurity.co.nz](mailto:sunjeet.khokhar@assurity.co.nz) |  |

# Appendix One –Terms and Conditions of Business

In these Terms and Conditions (**Terms**), references to “Assurity”, “we” or “we” references to Assurity Consulting Limited.

These Terms will apply to all work Assurity undertakes for you with respect to this engagement. These Terms form part of the Statement of Work entered into in respect of this engagement. In the event of a conflict between anything in these Terms and the Statement of Work, the Statement of Work shall prevail.

1. **Fees**

Our fees are calculated principally based on the time involved. We will provide the services set out in the Statement of Work (“the Services”) and will use all reasonable commercial efforts to provide the Services in an efficient and timely manner, using the necessary skill and expertise to an appropriate professional standard.

1. **Disbursements**

All costs incurred by Assurity on your behalf for out of town travelling, accommodation, meals, toll calls, telegrams, telexes, courier fees, shipment of parcels, word processing, typing, photocopying and printing of manuals and technical documentation, data entry, computer use, computer consumables, and other disbursements will be charged to you at cost, without the addition of any service charge.

Depending on the circumstances, a fixed rate may be negotiated to cover accommodation and meals.

In dealing with any matter for you, we may have to make payment(s) to third parties on your behalf. Should this apply, we may require an advance payment for the full amount(s). On completion of the matter, we will provide you with a full statement of account.

1. **Billing**

Our normal procedure is to bill Services on a monthly basis. However, in certain circumstances, this may be inappropriate and such cases will be discussed with you on an individual basis.

If, as a consequence of the provision of services or products to you, Assurity becomes responsible for sales tax, customs duty or other taxes, duties, tariffs, levies or surcharges imposed by any governmental or statutory authority, these extra costs will be charged to you. An invoice will be issued immediately Assurity incurs any such costs and will be due for payment within 20 days of the invoice date.

1. **Terms of Payment**

Our terms of payment are **20 days** from the invoice date unless alternative arrangements have been agreed.

We reserve the right to charge default interest at the current standard commercial overdraft rate charged by our bank on all fees not paid by the due date. Default interest is calculated on a daily basis from the due date to the actual date of payment.

You will be liable for all legal and debt collection costs that we may incur in enforcing, or attempting to enforce, our rights under these terms and conditions.

1. **Reporting**

We will generally report to you on a weekly basis. Reports will generally include work completed, work planned and the estimated completion times and costs.

1. **Ownership**

We shall retain ownership of the copyright and all other intellectual property rights in the product of the Services, whether oral or tangible, and ownership of our working papers and code. You shall acquire ownership of any product of the Services on payment of our charges. For the purposes of delivering Services to you or other clients, Assurity shall be entitled to use, develop or share with each other knowledge, experience and skills of general application gained through performing the Services.

1. **Staff**

You agree that during the provision of the Services, and for a period of twelve months thereafter, you will not make any offer of employment to any Assurity employee involved in the provision of the Services, without our prior written consent.

You agree that should you employ any Assurity employee involved in the provision of the Services during the provision of the Services, and for a period of three months thereafter, you will pay Assurity a fee equal to 25% of the remuneration package offered to the person concerned.

1. **Benefit of advice**

Unless otherwise specifically stated in the Engagement Letter, any advice or opinion relating to the Services is provided solely for your benefit and may not be disclosed in any way, including any publication on any electronic media, to any other party and is not to be relied upon by any other party.

During the supply of our Services, we may supply oral, draft or interim advice, reports or presentations but in such circumstances, our written advice or final written report shall take precedence.

Assurity shall not be under any obligation in any circumstance to update any advice or report, oral or written, for events occurring after the advice or report has been issued in final form.

1. **Confidentiality**

Both parties acknowledge that they may, in the course of the engagement acquire information that is proprietary or confidential to the other party.

Both parties agree to hold such information in strict confidence, and not to divulge such information except as required by law or judicial process, by any persons or bodies responsible for regulating your business or your internal policies.

1. **Termination of Services**

You may terminate with two weeks’ notice, any services provided on an hourly basis. You will be charged for services provided up to the time of termination.

Either of us may terminate without further notice where:

* + The other has committed a material or persistent breach of any of its obligations under this agreement.
  + The other becomes insolvent; or
  + The services are suspended for whatever reason for more than 10 normal working days.

Termination must be effected by written notice served on the other.

Termination under this clause shall be without prejudice to any rights that may have accrued to either of us before termination and all sums due to us shall become payable in full when termination takes effect.

1. **Limitation of liability**

To the maximum extent permitted by law, you agree that Assurity's liability for any and all loss or damage suffered by you (whether direct, indirect or special) in connection with our engagement shall be limited to the amount of professional fees paid to Assurity for the Services and you agree to release Assurity from all claims arising in connection with the Services to the extent that Assurity’s liability in respect of such claims would exceed this amount.

To the maximum extent permitted by law, you agree that any loss or damage suffered by you which is directly or indirectly attributable to negligence, fault or lack of care on your part or on the part of any other person (including advisors to you), Assurity is not liable (in contract, tort or otherwise) for the loss or damage.

You agree that all claims against Assurity, whether in contract, negligence or otherwise, must be formally commenced within two years after the party bringing the claim becomes aware (or ought reasonably to have become aware), of the fact which gave rise to the action.

1. **Indemnities**

To the maximum extent permitted by law, you agree to indemnify and hold harmless Assurity against any and all losses, claims, costs, expenses, actions, demands, damages, liabilities or any other proceedings, whatsoever incurred by Assurity in respect of any claim by a third party arising from or connected to any breach by you of your obligations under this Agreement.

1. **Health and safety**

We are required to comply with the provisions of the Health and Safety in Employment Act 1992 (the "Act") by taking all practical steps to ensure the health and safety of our people. Assurity expects our people to take responsibility to ensure their own safety and that no harm is caused to others in the workplace. However, the Act places responsibility for their safety on you when they are visitors to your site. It may be appropriate for your Health and Safety representative to hold a safety briefing at the beginning of the assignment for those involved, regarding the hazards, provision of any appropriate equipment, awareness of accident reporting procedures and emergency procedures.

1. **Communications**

We do not accept any liability for loss arising from non-receipt of any communication, including computer email communications.

1. **Governing law and jurisdiction**

The SOW, these Terms, and all aspects of our engagement and our performance of the Services are governed by, and construed in accordance with, the laws applicable in New Zealand. Both parties agree to irrevocably submit any disputes arising in connection with our engagement to the exclusive jurisdiction of the Courts of New Zealand.

1. **Variation**

No variation of the SOW or these Terms will be valid unless confirmed in writing by authorised signatories of both parties on or after the date of signature of the Engagement Letter in question.

1. **Statutory terms**

Nothing in these Terms excludes, restricts or modifies the application of the provisions of any statute where to do so would contravene that statute or cause any part of these Terms to be void.

1. **Assignment**

You may not assign any of your rights and obligations under the SOW and these Terms unless you have obtained our prior written consent. We may assign any of our rights and obligations under the SOW and these Terms without your consent.

1. **Entire Agreement**

Unless otherwise agreed in writing, the SOW and these Terms constitute the entire understanding between the parties to this Agreement.