

**MITRAIS WHITE PAPER  
TESTING AUTOMATION TOOLS  
COMPARISON AUGUST 2018**

**VER.0.3**

# Table of Contents

Table of Contents .....	2
Table of Figures.....	3
1. Overview.....	4
2. Evaluated Platforms.....	4
3. Other Platforms.....	4
4. Evaluation Criteria .....	4
5. Platform Evaluation .....	7
6. Platform Recommendation.....	7
7. Conclusion.....	17
Copyright .....	17
Copyright © 2018 Mitrais .....	17
Disclaimer .....	17

## Table of Figures

Table 1 – Evaluated Platforms .....	4
Table 2 – Non-Feature Related Criteria .....	5
Table 3 – Feature Related Evaluation Criteria .....	6
Table 4 – Platform Evaluation.....	7

## 1. Overview

This White Paper was conducted originally to evaluate MUIT (Mitrais UI Test Automation), Squash TA with Selenium as a Test Automation tools, Telerik Test Studio, Ranorex, Testim and Katalon Studio.

This evaluation is designed to assist our clients in choosing the correct test automation tool for their own unique requirements.

## 2. Evaluated Platforms

	PLATFORM
1	MUIT
2	Squash TA
3	Test Studio
4	Ranorex Studio
5	Testim
6	Katalon Studio

Table 1 – Evaluated Platforms

## 3. Other Platforms

Other platforms, which are not evaluated but may be included in the future are listed below:

- NA

## 4. Evaluation Criteria

The evaluation criteria give points to selected criteria where the weight of each criteria is determined by the importance of that criteria.

NB: This document uses a weighting schema, which is currently relevant for Mitrais use.

### 4.1. Non-Feature Related Criteria

CRITERIA	MITRAIS WEIGHTING
Entry Cost	40
License Cost for Per User	30
Ability to be Commercialized	50
Documentation	20
Training Options	30

CRITERIA	MITRAIS WEIGHTING
Technical Support	20

**Table 2 – Non-Feature Related Criteria**

Criteria used:

1. **Entry Cost**  
Entry cost means the initial cost to start using the tools. This is the license cost of minimal number of users. It may not be the same between tools. The lower the better.
2. **License Cost per User**  
This is the cost per user, as the entry cost for the tools is not always equal to the cost per user. The lower the better.
3. **Ability to be commercialized.**  
Free or cheap tools sometimes have some limitations on licensing or features. This criterion tries to capture whether there are any limitations that make a solution using the BI tools unsuitable for sale. Lower points mean that there are some factors that may make them unsuitable for commercial purpose.
4. **Documentation**  
This concerns the availability and comprehensiveness of the documentation on how to work with the tools.
5. **Training Options**  
In general, this is the “cost” to train resources in how to use the tool. The evaluation should be based on:
  - a. The availability of online training material and/or formal class (and their pricing). Ideally all training materials should be available online.
  - b. The learning curve a new developer will have to face to understand how to implement the product. The easier it is to implement the better.
6. **Technical Support**  
The speed and availability of support when required. The team evaluated this criterion by analysing reviews of the product.

#### **4.2. Feature Related Criteria**

CRITERIA	MITRAIS WEIGHTING
Platform Supported	50
Browser Supported	50
Mobile App Support	10
Installation	10
Scripting Language Supported	50
Scripting Creation Time	50
Object Recognition	25
Continues Integration	40

CRITERIA	MITRAIS WEIGHTING
Data Store	25
Reporting/Test Report	25
Test Case Management	50
User Audience	50

**Table 3 – Feature Related Evaluation Criteria**

Criteria used:

1. Platforms Supported  
This criterion evaluates the platforms supported by the tool. What operating systems are supported (Linux/Unix, Mac OS, Windows, Android, iOS)? The more the better.
2. Browser Supported  
This criterion evaluates the browsers supported by the tool (IE, Chrome, Firefox, etc.). The more the better.
3. Mobile App Support  
This criterion evaluates whether the tool supports testing for native or hybrid mobile applications.
4. Installation  
This criterion evaluates the level of difficulty involved in installing the tools.
5. Scripting Language Supported  
This criterion evaluates how many scripting languages the tools can work with. The more the better.
6. Scripting Creation Time  
This criterion evaluates how fast QA engineering can create a script for any test case.
7. Object Recognition  
This criterion evaluates how users define the object. How will your test know which button it's supposed to click? Human testers can easily tell the difference between two buttons, but in automation this is a slightly more complex matter as it concerns the tool's ability to use data integration and to create data warehouses.
8. Continues Integration  
This criterion evaluates how the tool can be integrated with other tools to maintain code repository, automate the build, make the build self-testing and automate reporting and delivery.
9. Data Store  
This criterion evaluates how the framework can load data for testing from a data store.
10. Reporting/Test Report  
This represents how well the tool shows reports after executing a test.
11. Test case Management  
Supports test management that allows testers to manage the test in-group and can executed any combination of tests.

## 12. User Audience

User groups of user does the tool primarily target:

- **Testers** possess a good understanding of test processes, but often lack a strong programming background or deep knowledge of software development methodologies.
- **Test Developer**, possess all of a tester's skill set, plus have formal training in programming and experience working on software development projects.

## 5. Platform Evaluation

PLATFORM	Non-Feature Criteria					
	1	2	3	4	5	6
<b>MUIT</b>	360	270	450	120	240	80
<b>Squash TA</b>	360	270	400	160	180	120
<b>Test Studio</b>	280	210	350	180	240	140
<b>Ranorex</b>	200	210	350	180	270	140
<b>Testim</b>	200	210	350	180	240	160
<b>Katalon</b>	360	270	400	180	270	160

PLATFORM	Feature Criteria												TOTAL SCORE
	1	2	3	4	5	6	7	8	9	10	11	12	
<b>MUIT</b>	300	350	50	80	300	400	175	280	150	150	350	450	4555
<b>Squash TA</b>	400	450	70	60	400	300	175	320	200	200	400	350	4815
<b>Test Studio</b>	300	450	80	80	400	400	175	320	200	200	450	400	4855
<b>Ranorex</b>	300	400	80	80	400	400	175	320	200	225	450	450	4830
<b>Testim</b>	450	450	50	90	300	400	175	320	150	125	450	400	4700
<b>Katalon</b>	400	450	50	80	400	450	200	320	200	225	450	450	5315

Table 4 – Platform Evaluation

## 6. Platform Recommendation

### 6.1. Non-Feature Related Criteria

Entry Cost

SOLUTION	EVALUATION
MUIT	MUIT is an internal tool for Mitrais and is free for Mitrais

SOLUTION	EVALUATION
SquashTA	SquashTA is open source software and is free
Test Studio	Telerik Test Studio prices starts at \$3449/year for 100 virtual user
Ranorex	Ranorex license is starting from € 2290/year per user
Testim	Testim license is starting from \$ 800/month per user
Katalon	Katalon is open source software and is free

**Conclusion:**

- MUIT: 9
- SquashTA: 9
- Test Studio: 7
- Ranorex: 5
- Testim: 5
- Katalon: 9

MUIT, SquashTA and Katalon are free, but Test Studio, Ranorex and Testim are paid frameworks.

#### 1.1.1. License Cost Per User

SOLUTION	EVALUATION
MUIT	MUIT is an internal tool for Mitrais so no license cost for Mitrais
SquashTA	SquashTA is open source software and is free
Test Studio	Already included on entry cost for 100 virtual users
Ranorex	Just for 1 user per license and shared with 1 concurrent user
Testim	Already included on entry cost for 1 users, to have unlimited users to buy site licensing.
Katalon	Katalon is open source software and no license cost user

**Conclusion:**

- MUIT: 9
- SquashTA: 9
- Test Studio: 7
- Ranorex: 5
- Testim: 5
- Katalon: 9

MUIT, SquashTA and Katalon are free. Test Studio is free for 100 virtual users. Ranorex is just for 1 user and shared with 1 concurrent user. Testim price is based on 1 user buying a site license for unlimited users.

#### 1.1.2. Ability to be commercialized

SOLUTION	EVALUATION
MUIT	No limitations on license or feature



SOLUTION	EVALUATION
SquashTA	No limitations on license or feature
Test Studio	No limitations on license or feature
Ranorex	No limitations on license or feature
Testim	No limitations on license or feature
Katalon	No limitations on license or feature

**Conclusion:**

- MUIT: 9
- SquashTA: 8
- Test Studio: 7
- Ranorex: 7
- Testim: 7
- Katalon: 8

MUIT is Mitrais' internal product. Squash TA and Katalon are open source. There is no limitation on licences, and redistribution is allowed. There are no feature limitations for Test Studio, Ranorex and Testim once purchased.

### 1.1.3. Documentation

SOLUTION	EVALUATION
MUIT	Limited documentation or user guide
SquashTA	Some references are available on Squash TA Web and wiki
Test Studio	Multiple options directly from Telerik with complete documentation for all modules
Ranorex	Cover all documentation from basic usage, advanced, and multi-platform.
Testim	Multiple options directly from Testim with complete documentation for all modules
Katalon	All references are available on Katalon Web and Forum. Premium support offered by KMS technology.

**Conclusion:**

- MUIT: 6
- SquashTA: 8
- Test Studio: 9
- Ranorex: 9
- Testim: 9
- Katalon: 9

MUIT doesn't have a user guide. Learning comes from QA experience in Mitrais. Squash TA has a complete user guide as reference. Test studio provides multiple options directly from Telerik, with complete documentation for all modules. Ranorex covers all documentation from basic usage, to advanced and multi-platform uses.

#### 1.1.4. Training Options

SOLUTION	EVALUATION
MUIT	No online training available. Learning curve for a new QA engineer is much easier. Only need to know proprietary keywords.
SquashTA	No online training available. A new QA engineer requires knowledge of the selected scripting language, which usually forces the tests to be written by an experienced automation engineer.
Test Studio	4-hour video track covers functional test automation for web, Silverlight and WPF applications, and will help an engineer learn how to solve common automation issues and keep their tests maintainable. Price: \$899
Ranorex	Online training is available, but users need to contact Sales Team to get more detail on training pricing. Support webinar, online conference, forum and workshop
Testim	No online training available. Testim Help Center page contains advice and answers from the Testim Team.
Katalon	Online training is available (part of paid services). There are two services options available which \$3,000/year and \$150/hour. More than 1.200 video tutorials available in Youtube for Katalon search and a web forum is provided.

#### Conclusion:

- MUIT: 8
- SquashTA: 6
- Test Studio: 8
- Ranorex: 9
- Testim: 8
- Katalon: 9

#### 1.1.5. Technical Support

SOLUTION	EVALUATION
MUIT	No technical support since the MUIT is internal tool which is created by experienced SE and QA
SquashTA	Limited support comes from open source community
Test Studio	Telerik provides 24 hours' technical support; technical support is part of product pricing.
Ranorex	Technical support is available in online documentation but does not provide call services. The cost for technical support is part of product pricing.
Testim	Provide calls for extended support, also chat support is free. There are separate prices for technical support. Need to contact Testim sales team for detail price.
Katalon	Katalon with KMS Technology provide flexible support options via email and call, technical support will be part of paid services of KMS technology. Free technical support will be limited, free support comes from open source community.

**Conclusion:**

- MUIT: 4
- SquashTA: 6
- Test Studio: 7
- Ranorex: 7
- Testim: 8
- Katalon: 8

**6.2. Feature Related Criteria****6.2.1. Platform Supported**

SOLUTION	EVALUATION
MUIT	MUIT is available on Windows OS only.
SquashTA	Squash TA is available on Windows OS, Linux, Mac OS
Test Studio	Test Studio is available on Windows OS only.
Ranorex	Ranorex is available on Windows OS only.
Testim	Testim is web application hosted in Testim server.
Katalon	Katalon is available on Windows OS, Linux, Mac OS. No need to install.

**Conclusion:**

- MUIT: 6
- SquashTA: 8
- Test Studio: 6
- Ranorex: 6
- Testim: 9
- Katalon: 8

MUIT, Test Studio and Ranorex is on premise only support for windows, SquashTA and Katalon is on premise but support cross platform. Testim is a cloud-based application.

**6.2.2. Browser Supported**

SOLUTION	EVALUATION
MUIT	MUIT can test applications run on Firefox, IE, Chrome
SquashTA	SquashTA can test applications run on Firefox, IE, Chrome, Opera, Safari
Test Studio	Test Studio can test applications run on Firefox, IE, Chrome, Opera and Safari
Ranorex	Ranorex can test applications run on Firefox, Chrome, IE, Chromium
Testim	By default Testim can test applications run on Chrome. To test application using Firefox, IE, Edge and Safari need to run test CLI
Katalon	Katalon can test applications run on Firefox, IE, Chrome, Edge and Safari.

**Conclusion:**

- MUIT: 7
- SquashTA: 9
- Test Studio: 9
- Ranorex: 8
- Testim: 8
- Katalon: 9

### 6.2.3. Mobile App Support

SOLUTION	EVALUATION
MUIT	The current version of MUIT does not support mobile apps, only supporting Web Apps.
SquashTA	Since SquashTA can be used with PLC Selenium, it supports mobile app testing
Test Studio	Easily test iOS and Android apps. Runs tests on real devices and emulators without writing a single line of code
Ranorex	Support both Android and IOS.
Testim	Currently Testim is not supported for mobile app, only supporting Web Apps.
Katalon	Its official website mentioned Katalon being supported by both Android and IOS, but this is not yet proven. It has successfully run a mobile test.

#### Conclusion:

- MUIT: 5
- SquashTA: 7
- Test Studio: 8
- Ranorex : 8
- Testim: 5
- Katalon : 5

### 6.2.4. Installation

SOLUTION	EVALUATION
MUIT	MUIT requires simple installation and prerequisite (e.g. Java SDK, Gradle, cucumber)
SquashTA	SquashTA requires complex installation procedure, such as SquashTA toolbox, SquashTA server, Squash Eclipse
Test Studio	Requires simple installation and prerequisite .NET Framework
Ranorex	Requires simple installation and prerequisite .NET Framework
Testim	No installation required. Testim is web application just needing an internet connection to run.
Katalon	Requires simple installation, needs to have Java SDK and Appium to run.

#### Conclusion:

- MUIT: 8
- SquashTA: 6
- Test Studio: 8
- Ranorex: 8
- Testim: 9
- Katalon : 8

### 6.2.5. Supported Scripting Language

SOLUTION	EVALUATION
MUIT	MUIT script is keyword driven, like human language. The inspect element needs basic programming skill only.
SquashTA	Since Squash TA using Selenium, it is supported by Java, Python, Ruby, Php, Perl, JavaScript
Test Studio	Supported by C# and VB
Ranorex	Supported by C# and VB
Testim	Supported by JavaScript
Katalon	Supported by Apache Groovy, and keyword driven

#### Conclusion:

- MUIT: 6
- SquashTA: 8
- Test Studio: 8
- Ranorex: 8
- Testim: 6
- Katalon: 8

### 6.2.6. Scripting Creation Time

SOLUTION	EVALUATION
MUIT	MUIT script is keyword driven and easy to understand. The inspect element needs basic programming skill only.
SquashTA	Needs much more creation time depending on the skill level of QA engineering.
Studio Test	Needs less creation time since it has recording tool
Ranorex	Needs less creation time since it has recording tool
Testim	Needs less creation time since it has recording tool
Katalon	Needs less creation time since it has recording tool and tests can be manually using keywords.

#### Conclusion:

- MUIT: 8
- SquashTA: 6
- Test Studio: 8
- Ranorex: 8
- Testim: 8
- Katalon: 9

### 6.2.7. Object Recognition

SOLUTION	EVALUATION
MUIT	Able to use SeleniumIDE, FireBug, FirePath to define an object definition
SquashTA	Able to use SeleniumIDE, FireBug, FirePath to define an

SOLUTION	EVALUATION
	object. Using export from SeleniumIDE, the test script can be generated
Test Studio	Easy for object recognition since it use recording tool
Ranorex	Easy for object recognition since it have recording tool
Testim	Easy for object recognition since it use recording tool
Katalon	Easy for object recognition since it use recording and has feature Spy to define object definition

#### Conclusion:

- MUIT: 7
- SquashTA: 7
- Studio Test: 7
- Ranorex: 7
- Testim: 7
- Katalon: 8

#### 6.2.8. Continuous Integration

SOLUTION	EVALUATION
MUIT	Can be achieved through Gradle and Jenkins
SquashTA	Can be achieved using Squash TM including Jenkins and also reporting to JIRA
Test Studio	Able to integrate with any Build Server, such as Jenkins, CruiseControl, Bamboo, Visual Studio, TeamCity
Ranorex	Supports code maintenance or versioning (git), TFS
Testim	Able to integrate with CI/CD tools such as Jenkins, TeamCity, CircleCI, SauceLabs, Codeship and Bamboo
Katalon	Able to integrate with CI/CD tools such as Jenkins, SauceLabs, Git.

#### Conclusion:

- MUIT: 7
- SquashTA: 8
- Test Studio: 8
- Ranorex: 8
- Testim: 8
- Katalon: 8

#### 6.2.9. Data Store

SOLUTION	EVALUATION
MUIT	MUIT is unable to read data from external source. We add data inside the scripting file using json
SquashTA	Squash TA is able to read from DB and other file types such as csv and excel file.
Test Studio	Test Studio is able to read from DB and other file types such as xml, csv and excel file.
Ranorex	Ranorex is able to read from DB and csv, other type files such as excel.

SOLUTION	EVALUATION
Testim	Testim unable to read data from external source. Data set can be added from inside apps using Json format.
Katalon	Katalon is able to read data from external source, with type Excel, CSV and from internal data as a database data.

**Conclusion:**

- MUIT: 6
- SquashTA: 8
- Test Studio: 8
- Ranorex: 8
- Testim : 6
- Katalon : 8

### 6.2.10. Reporting/Test Report

SOLUTION	EVALUATION
MUIT	MUIT produces cucumber report after running process is finished. It contains the testing scenario and error details.
SquashTA	SquashTA doesn't produce reports directly. Squash TM will produce the report.
Test Studio	Test results are visualized through interactive graphs and charts. Users can explore their test list results over time, export reports in common file formats (as image or html), and leave comments within reports. Once the test is executed and the results are analysed, the test can be directly published to the selected project build by instantly connecting to the TFS.
Ranorex	Test result are complete starting from status, computer user, OS, execution time, total error(s) total warning(s), within the screenshot each step and each action and also graph.
Testim	MUIT produces test report after running a test or suite is finished. It contains the testing scenario, test Pass/Fail, Browser and also detailed duration. There is no exporting feature for reporting.
Katalon	Katalon provides completes reports such as Excel, Word, VS, XML and HTML contains detail test (test steps included), Web pages (test environment, test steps also included), screen shoot for Fail test.

**Conclusion:**

- MUIT: 6
- SquashTA: 8
- Test Studio: 8
- Ranorex : 9
- Testim : 5
- Katalon : 9

### 6.2.11. Test Case Management

SOLUTION	EVALUATION
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SOLUTION	EVALUATION
MUIT	There is no specific UI to manage the test case. Directly to Windows folder.
SquashTA	There is no specific UI to manage test cases. Need to integrate with SquashTM to have complete test management features.
Test Studio	TestStudio has certain Projects to classify the tests. Test case type can also be used and is good for managing test cases.
Ranorex	Ranorex has specific folders for Test Case and Test Suites. Handles parameterized and configured data well in managing test case.
Testim	Testim has Automated page, which has Test list page, Suites page, Plans page, also labels, and is good in managing test cases.
Katalon	Katalon has specified folders for Test Cases and Test Suites. Folder feature is to classify the test case, and is good in managing test cases.

**Conclusion:**

- MUIT: 7
- SquashTA: 8
- Test Studio: 9
- Ranorex : 9
- Testim : 9
- Katalon : 9

### 6.2.12. User Audience

SOLUTION	EVALUATION
MUIT	Most group user can be Test and Test Developer
SquashTA	Most group user can be Test Developer
Test Studio	Most group user can be Test and Test Developer
Ranorex	Most group user can be Test and Test Developer
Testim	Most group user can be Test and Test Developer
Katalon	Most group user can be Test and Test Developer

**Conclusion:**

- MUIT: 9
- SquashTA: 7
- Test Studio: 8
- Ranorex : 9
- Testim : 8
- Katalon : 9

SquashTA needs significant technical skills to prepare the test for the environment and to integrate it with automation tools such Selenium, Sahi or other.

MUIT, Ranorex and Katalon can start from a simple test creation and are able to advance if user want to create tests manually from test script.



Test Studio and Testim are able to create tests manually and create scripts by modifying the recording test.

## 7. Conclusion

Using Mitrais weighting criteria, the team recommended Katalon Studio.

Katalon Studio is built on open-source frameworks like Selenium and Appium, and is out-of-the-box ready to use with multiple integrations such as qTest, JIRA, GIT, etc.

Katalon Studio allows users with less experience in programming to work effortlessly by providing a predefined automation framework with hundreds of built-in keywords.

Please note that this is the result from the Mitrais criteria-weighting schema, which correlates with Mitrais current needs. Other clients may use this report with different weightings to meet their unique requirements and come to a different conclusion.

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