



SmartBear White Papers

ALM Tools

Test Case Automation

This document discusses regression test cases, when to automate them, and how to analyze the results of your automation.

Narrative

Companies that develop and maintain software can dramatically improve the quality of their software releases by creating regression test cases that ensure that existing features are not broken with new releases.

This white paper discusses:

- How to create regression test cases
- When to automate regression test cases
- Best practices for automation analysis

Creating Regression Test Cases

Once a software product has been released to product, each new release of the software could cause existing features to fail. To prevent this, it is wise to create a set of regression test cases that are run with each new release. Below are some best practices when developing a regression suite:

- **Categorize by Functional Area** – Your software product most likely has different sets of functional areas (e.g. Invoicing, Billing, etc). When creating regression test cases, categorize them by functional area so that you can ensure you have good test coverage for each functional area of your software.
- **Regression Test Case Design** – Regression test cases do not normally need to test bounds, invalid data entry, etc – normally they will be designed to test the software the way it is designed to work. The reason for this is that when the feature was originally designed, it should have been thoroughly tested for bounds, invalid data, etc. An exception to this is if you find that new releases tend to break existing features from a validation perspective. If this is the case, keep some specialized regression test cases to ensure that the validations are still in place.
- **Revisit the Regression Set with each New Release** – Upon implementing a new release of your software, it is wise to recognize new features shipped with the new release and to create a new set of regression test cases that test the new features. If you do not revisit your regression test cases with each new release of your software, the regression test cases will become stale and out dated.

When to Automate Regression Test Cases

Many companies run their regression test cases manually, so when does it make sense to begin automating your regression test cases? It makes sense to automate your test cases when you can no longer run the regression test cases on each build created. For example, if you are doing daily or weekly builds of your code to quality assurance and you cannot quickly run your regression test cases with each build, it is time to consider automating them.

To automate test cases, you must purchase an automated testing tool. There are many great tools on the market, including Automated QA Test Complete, HP Quick Test Pro, HP Win Runner, Rational Robot and Rational Functional Test, just to name a few. We normally recommend Automated QA Test Complete (<http://www.TestComplete.com>), as it is competitively priced and has similar features as the others.

Once you have purchased an automated tool, you can use the tool to create your regression test cases. Each test case becomes a script. Many tools have record and playback features where you can turn the recorder on, open your software and perform the actions for a test scenario, then save the recording. This is a great way to learn the scripting engine, but it is not usually adequate to create well designed automated test scripts.

Normally, you will want to have a technically minded software quality engineer in your organization that creates and maintains the automated scripts, as using these tools require knowledge of the tool, programming skills and great trouble shooting skills.

If you are initially creating your automation strategy, it is wise to consult with an automation expert to ensure best practices for your automation design. There are many companies that specialize in this, contracting with an automation expert can save effort and costs in the long term, as they will normally work with you to provide an automation framework that will be reusable and can provide training to your software quality engineer(s), allowing them to make great strides with their automation skill set in very little time.

If you would like to see how ALMComplete integrates with the major automated testing tools, download the User's Guide at http://www.softwareplanner.com/usersguide_tc.pdf.

Best Practices for Automation Analysis

Once your regression test cases are automated, they should be automatically run upon new builds of your software. If you can do daily builds of your software into your quality assurance environment, this is ideal. Once the automation is running daily, you will need a way to quickly determine how many automation test cases were run, how many passed and how many failed. For failed tests, you will want to drill into the detailed logs to determine what caused the failure.

ALMComplete (<http://www.SoftwarePlanner.com>) is an ALM tool that can manage this process. ALMComplete integrates with Test Complete, our award winning automated functional testing tool. By integrating automated testing into ALMComplete, you can view the run results from within ALMComplete. You can also trend these results using graphical dashboards.

Analyzing the Automated Test Runs in ALMComplete

ALMComplete provides reports and dashboards that show the results of each automation run. Below is a report that shows the daily runs:

Automation Runs

Actions	Id	Host Name	Status	Nbr Tests	Nbr Failed	Nbr Passed	Test Name	Start Time	End Time	D
	1280	SM-PRECISION	Failed	1	1	0	Full Regression	Wed 12/01/2010 08:28 AM	Wed 12/01/2010 08:27 AM	0
	1281	SM-PRECISION	Passed	1	0	1	Full Regression	Wed 12/01/2010 02:49 PM	Wed 12/01/2010 02:49 PM	0
	1282	SM-PRECISION	Passed	1	0	1	Full Regression	Wed 12/01/2010 02:54 PM	Wed 12/01/2010 02:54 PM	0

Automation Runs - Groups

- SM-PRECISION (108)
 - Today (3)
 - Yesterday (2)
 - Monday (1)
 - Last Week (4)
 - Two Weeks Ago (4)
 - Three Weeks Ago (13)
 - Last Month (31)
 - Two Months Ago (16)
 - Three Months Ago (4)
 - Older (54)
- SM-PRECISION-TC (13)

Below is a dashboard that shows it graphically:

Test Cases

Automation Tests Trending (Current Project)
Excludes deleted

Date	Failed	Passed
18 Nov	1	0
19 Nov	0	0
20 Nov	1	0
21 Nov	1	0
22 Nov	1	0
23 Nov	0	2
24 Nov	0	0
25 Nov	0	0
26 Nov	0	0
27 Nov	0	0
28 Nov	0	0
29 Nov	1	0
30 Nov	1	1
01 Dec	1	2

Automation Runs

Manual Test Case Trending (Current Project)
Excludes Closed (0 items)

Date	Failed	Passed	Awaiting Approval	Awaiting Run
18 Nov	1	82	0	0
19 Nov	0	82	0	0
20 Nov	0	82	0	0
21 Nov	0	82	0	0
22 Nov	0	82	0	0
23 Nov	4	84	0	33
24 Nov	4	84	0	33
25 Nov	4	84	0	33
26 Nov	4	84	0	33
27 Nov	4	84	0	33
28 Nov	4	84	0	33
29 Nov	4	84	0	33
30 Nov	5	85	0	31
01 Dec	7	86	0	28

Return on Investment

You should see a return on investment within one release of your software after implementing an automation test strategy. This will be achieved by:

- **Quicker Releases** – By having your regression test cases run automatically, your software quality team can concentrate on testing new features of your software and less time regressing existing features.
- **Higher quality releases** – Your software releases will have fewer bugs and require less customer support because they will be of higher quality.
- **Happier Customers** – Your customers will be happier and more willing to serve as testimonials for future prospects.

Learn More

If you wish to learn more about ALMComplete, request a free a trial, or receive a personalized demo of the product, contact **SmartBear Software** at +1 978-236-7900. You can also learn more at <http://www.SoftwarePlanner.com>. You can learn more about the automation integration at <http://www.softwareplanner.com/Services.asp>.