

Regression Suite Optimization



STAG's assessment for test case potency of a cloud-based trading software helps reduce regression test cases by 28% and regression cycle time by 40% for an award-winning B2B e-commerce company.



Domain/Category - B2B Integration for Supply Chain Management



Technology - JAVA/J2EE, Oracle, Apache, IBM WebSphere, HTTPS and FTP

CUSTOMER AND PRODUCT BACKGROUND

The customer is a global leader and award-winning B2B e-commerce company providing managed services to Fortune 100 companies around the world.

The product in question is regarded as a 'Platform as a Service' environment, and provides connectivity to numerous hosted B2B applications that allow companies to deploy scalable trading platforms anywhere in the world. The product was released over a decade ago, and has more than 42 components. The application used Session Initiation Protocol (SIP) for signaling and Real Time Protocol (RTP) for streaming.






PROBLEM STATEMENT

The product was evolving, with enhancements and releases every six months. The client's India Development Center was entrusted with the responsibility of making changes in product solutions to suit new environments. However, the management was not convinced with the testing effort expended by the in-house QA team as against the development effort. The question the management found itself asking was 'Is our testing optimized, or are we conducting more tests than are necessary?' That is when it decided to seek the help of an independent third party QA expert.

SOLUTION

The main challenge for the STAG team was understanding the product without any specification documents. The client had not documented any execution test results on any environment, and there were no proper artifacts available except for test cases and the defect log. The test cases were very old and designed like use cases. They were at a very high level, and had not been updated with enhancements in application behavior.

The STAG team did a quick assessment of the situation and noted that the product was in the maintenance stage and that the number of test cases to be executed to certify the build was 75,000+. The SDLC was followed by smooth product migration from the QA environment to deployment first in the pre-production environment and then subsequently in the production environment. The team also noted that any change in the product component called for validation of the entire product suite, which had multiple impacts due to critical factors like the product components being developed across multiple locations and lack of consistency when it came to component usage: different components were being used by different users across the globe.

-  # TC: 4066
-  # Defects: 52
-  # PDTs: 169
-  # Cycles of testing: 5
-  # Product feature enhancement suggestions: 5

The STAG team then proposed a solution that was to be delivered in two parts:

A. Assessing the potency of the existing test cases

The STAG team explored the product independently, using the HBT Landscaping technique for a better understanding of product functionality. The team also did a rapid qualitative analysis of the existing test assets.

In the next three weeks, the team processed the raw test cases to ‘structurize’ them: it segregated the existing test cases into Quality Levels (L1-L9) and test types (+ / -), and also identified the potential defect types (PDTs) and mapped them to the test cases. In the process, the team was able to identify the gaps in terms of requirements coverage, missing PDTs, missing test types, and the ratio of conformance: robustness distribution. The team also performed a qualitative analysis and discovered that the test cases were designed as a series of steps and that no formal techniques were applied.

Before					
	#PDTs	#TCs		#Defects	
		Total	'+ve		
C1	14	1304	1142	162	8
C2	20	543	353	190	6
C3	6	741	494	247	19
Total	40	2588	1989	599	33
Increase by					
	TC Yield		0.01	Defects/TC	

ADDITIONS (After)					
'+PDTs	'+TCs			#Defects	
	Total	'+ve	'-ve		
8	47	27	20	17	
8	176	114	62	7	
7	17	12	5	0	
23	240	153	87	24	
58%	9%	8%	15%	73%	
	TC Yield		0.10	Defects/TC	

B. Optimization of the regression suite

After assessing and fixing the issues with respect to test cases, the team performed five rounds of regression testing on the QA environment. The team executed approximately 4000 test cases in each round and found some interesting defects. It was also able to identify the stable modules and also those with more defects.

OUTCOME AND VALUE ADDITIONS

The test case potency assessment conducted by the STAG team ensured:

- Optimization of the regression test cases in the integrated QA and pre-production environment
- Cycle-wise defect reduction
- Improvement in the quality of test assets
- Strengthening of the test cases with superior test coverage

The regression test strategy that the STAG team implemented brought about a 28% reduction in the number of regression test cases, from 5636 to 4066. This in turn brought about a 40% reduction in the regression cycle time.