

Creating a dynamic, accessible and robust test automation framework for leading US edtech enterprise

Automating **44 test cases** for a complex and adaptive assessment platform



The Business

Customer is the leading Ed-Tech company in the US, focused on providing online education and fostering growth in students across Grade K to Grade 12 with their product portfolio



Online Education



Reading - only for Grade K-2



GSM



Mathematics



Reading - Grade 3-11



Student Growth Measure

We implemented a **dedicated test automation framework** covering multiple platforms and devices.

Context

Customer's Growth Measure is an online adaptive assessment platform consisting of a suite of tools for its users (admins, teachers and students) to collectively learn, assess and manage. Accessible on cross devices (such as desktop, laptop, Chromebook, iPad and Android Tablet), it consists of interactive assessments for multiple subjects that adapt dynamically with a student's performance.

Scenario

- Testing the adaptiveness and reliability of the assessments
- Migration of the application
- Automated scripts execution
- Complex functionalities across the assessments
- Challenges in licensing activities
- Data setup up for performance testing for bulk users

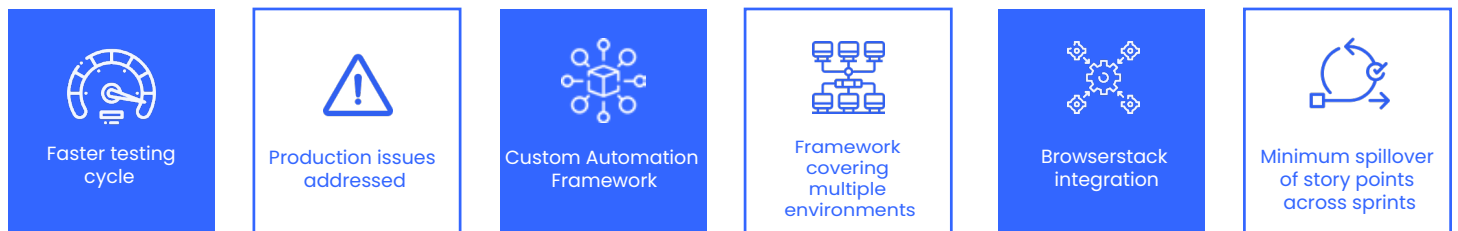
Faster testing cycles, minimal production defects and comprehensive test coverage to ensure that releases are quicker and exhibit premium quality.

Solution

Our credible, coherent and scalable test automation suite accelerated product releases, refined end user experience and improved accessibility across multiple environments.



Key Benefits



Key Challenges – Qapitol's Solution & Approach

1. Testing the adaptiveness and reliability of the assessments

Testing the adaptiveness and the reliability of the assessments required a knowledge base on the subject that was tested, in depth understanding of the algorithm and the different difficulty levels of the question. We incorporated various checkpoints such as Student grade, items/questions presented to that student, questions presented according to performance of the student, nature of the items, Grade based scores for the assessments, performance levels and assessment performance equivalence across different test windows etc., and ensured requirements validation of the applications. For each assessment, we focused on testing the student grades, individual items/questions and the supporting attributes for subsequent grades. Testing the adaptiveness required us to concentrate on the performance of the assessment while also ensuring that the items were not repeated throughout the assessment across different windows for the same students.

2. Application migration

To uphold the latest tech features such as enhancing the security, improving the performance of the system and incorporating a resource pool, the application is migrated frequently for which we ensured that the migrated component was tested properly along with the pre-existing application feature. We developed a

regression checklist comprising of regular features of the applications such as assessment assignment, assessment taking functionality, test tunnel features such as Welcome page, Save and exit on different pages, refreshes and reloads across different pages, welcome page, instructions page, assessment buttons and its functionalities, automatic assessment save on inactivity, alert messages on inactivity, scores display at the end of the assessment, error pages for undetermined circumstances, reports for student, reports of different students for teachers and their performance etc.. that should be intact and working as expected. This checklist ensured that no possible defects escaped to production.

3. Automated scripts execution

Since frequent changes were made to the application resulting in frequent releases, there was a need for an automation suite consisting of Smoke, Sanity and Regression test cases to be executed willingly by both developers and testers on each build or release. We developed a complete test suite for multiple subjects consisting of testing of key features and these scripts were automatically executed on every build through Jenkins. For this, we developed an understanding of each workflow, made sure all the flows were covered as part of the test case and tested thoroughly, prioritized test cases and automated

student, teacher, admin flows and verified student reports through automation. The entire test suite was developed using TestCafe where we used Javascript to automate the test cases. The complete suite consists of 44 test cases that were developed along with product testing. These test cases can be executed on any environment, for any grade and for any code development branch. These automation scripts include scenarios from high level to very detailed based on the suite triggered. And also as part of mathematics application we made sure the API performance was tested with load test, stability test and endurance test using gatling tool .

4. Complex functionalities across assessments

Customer product had many complex

functionalities applied to its assessments which included

- Tracking inactivity of the student on the assessment page and alerting them with appropriate message, auto saving of the assessment after some duration of inactivity which ensured that the student's progress was not lost,
- Complex nature of the assessment's algorithm and enhancing the test taking experience For granular student evaluation, large set of items/question were ETLd regularly,
- Tracking the time spent on the assessment since assessment duration helped to understand student performance,
- Completion of the assessment based on student performance and presenting it in a very detailed report etc

Outcome

Key Metrics:

Total Bugs Reported:

450+

No of Test Scripts (Manual & Automated):

44 test cases were automated within 2 months

- Detailed planning and development of the automation scripts
- Execution of Smoke, Sanity and Regression test cases for builds
- Spot checks for items that are newly added to the resource pool
- Listing out detailed test summary for each ticket verified
- Detailed planning and creation of the Gatling scripts for performance testing.

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