

# Leading Vehicle Retailer Drives Success with Modernization Through Automation Testing



## Challenges

Modernization of Client's existing auto finance and asset processing systems.

The time taken to discover bugs and defects was slow due to the time required to execute manual tests.



## Solutions

Automation was deployed to help with critical process testing to reduce results reporting time.

Automated regression testing was deployed to cut testing times and remove human error.



## Results

Manual testing was cut down by up to 30% through a shift towards using automation.

This in turn freed up 6 weeks' worth of manual regression testing efforts for each release.



## Client overview

Our Client, the largest used vehicle retailer in the United States, is driving integrity and transparency in every interaction across its retail, wholesale and auto financing businesses. Their first retail location opened in September 1993 in Richmond, Virginia. In addition, our Client's omni-channel strategy delivers the most customer-centric offering in the used auto market through a seamlessly integrated, best-in-class online and in-person experience, leveraging its more than 240 locations around the country to meet customers wherever they are. In 2022, they sold just over 800,000 vehicles to consumers.

They operate in two business segments namely sales operations and auto finance. Qualitest works specifically within the Auto Finance segment.

## Driving forces: modernizing auto finance and asset processing

Our Client was undertaking a major project to modernize their auto Finance and Asset processing. They decided to move to a first-class leading platform for auto finance and asset processing which was called ALFA Systems.

This required extensive functional and end to end testing, as a result both were launched and our Client ultimately released a customized version of ALFA. Qualitest drove functional and regression testing of ALFA prior to the release.

Qualitest remains involved by leading the testing efforts for configuration, patching, and upgrading functional testing. They also provide data staging in ALFA for downstream testing teams including integrations, letters and accounting that are impacted by ALFA.

A number of challenges came up that had to be overcome including:

- The application development began prior to Quality Engineering (QE) being engaged. Therefore, the QE team had to become familiar with the ALFA application very quickly.
- Test plans and end to end test cases were not scoped prior to QE being engaged.
- Initial QE analysis identified 1200+ process test cases, with 2300+ iterations, to cover over 70 Processes.
- Tests involved highly complex business and financial workflows in ALFA, and manual test cases were lengthy.
- Approximately 50% of the process tests required multiple days to execute accurately.
- Manual execution took a team of 11 Qualitest quality engineers and three Client engineers two months to complete a full suite of tests.
- 593 tests required the system date to be progressed into the future to complete execution delaying test results.
- The time to discover bugs and defects was slow due to the length of time required to execute manual tests.
- Integrations with applications outside ALFA further slowed testing efforts since tests had to often wait on batch process to be run nightly, weekly or monthly.
- The processes to get test cases updated and approved was lengthy.



## Building a fast, reliable and relevant test automation framework for maximum success

Resolving the challenges that arose during the project required two main elements:

- A test automation framework to support the new ALFA application.
- Automated regression testing that would cut testing times, remove human error, reduce results reporting time and streamline automation development.

Qualitest therefore implemented a streamlined approach with clear goals based on business process and priorities. This consisted of:

- Phase 1: assessment and framework development
- Phase 2: critical processes test automation
- Phase 3: remaining process tests developed by priority level
- Phase 4: date roll test case development

### Phase 1: assessment and framework development

The assessment process to develop the solution was very straightforward. First, we leveraged our Client's CarMax's subject matter experts and stakeholders to learn about their priorities and goals. The decision to use Java, Selenium and Test NG was made.

Manual tests were then created using business process testing components, so this model was followed to build automation components in a similar manner. It was determined that integrations could be simulated using APIs. SOAP API XML parsing and binding strategy was built using JAXB.

A prioritization plan was designed to first automate the critical process then tackle the remaining tests by test priority. Finally, progress reporting was built using Excel and stored in SharePoint for visibility.

### Phase 2: critical process test automation

In this phase, all automation resources were focused on building components necessary to cover the critical business processes. Once these components were built, 30% of the manual work effort was shifted to automation. The automated critical regression tests could be executed, and failures analyzed within 2 business days compared to several weeks of manual work. Critical regression from this point on is executed for every release and has established confidence in the automation testing.



### Phase 3: remaining process tests developed by priority level

The remaining tests were worked on in order of process priority. By the end of this phase, automaton was accepted and relied on as the primary avenue for regression testing. This process was able to further free up manual resources.

### Phase 4: date roll test case development

There were a significant number of tests that relied on the system date being progressed to a future date. Qualitest devised a three-step automation process to address the need to pause testing, execute a date roll script in the test environment then resume the test. This required logic and grouping of tests to avoid progressing the system date to far beyond the current date. This brought the automation test suite up to 97% coverage of the process regression tests.

The success of the test automation framework and ability to efficiently test via automation was recognized by Our Client who have engaged Qualitest to automate the testing of letters and A&F as part of an ongoing engagement.

## Key benefits

- Freed up 6 weeks' worth of manual regression testing efforts for each release.
- Reduced the staffing from 14 manual testers to only three, showing a very valuable ROI.
- The amount of manual work that was needed was cut down by up to 30% through a shift towards using automation.
- Full end to end regression testing of complex business processes was executed within two days for each release.
- A full cycle of test updates, test execution and failure resolution took a total of 10 business days rather than 21 business days.
- The ability to execute a partial test regression every two weeks as well as executing a full test regression with ALFA upgrade every month was provided.
- The automation test suite gave up to 97% coverage of the process regression tests.

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