CASE STUDY

Building Custom **Hybrid Test Automation Framework using AFTA 4.0** to cut testing efforts by 90% for Global Electronic Component Supplier

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Challenges

- Manual regression testing took 10 person-days, slowing releases.
- Cross-platform compatibility across devices, browsers, and resolutions.
- Required seamless backend integration with order processing.
- Needed CI/CD integration for faster, automated releases.
- Ensuring scalability while minimizing long-term maintenance costs.

About the Customer

Our client is a premier global independent distributor of electronic components, specializing in sourcing hard-to-find, obsolete, and end-of-life parts to ensure supply chain continuity. With over 20 years of industry experience, the company has expanded to more than 19 offices throughout the Americas, Europe, and Asia, employing over 600 professionals. Our client has grown into a $3B global organization, ranking it among the top electronics distributors globally. They offer comprehensive supply chain solutions for small, medium, and large global enterprises, including Fortune 500s, across numerous verticals such as computing, IT infrastructure, automotive, industrial automation, consumer electronics, medical and more.

The Need

To stay competitive in the global electronics market, the client aimed to develop their own e-commerce platform to digitize their supply chain services. This transition from offline to online required a robust, high-performing, and user-friendly application. Given the complexity of supply chain operations, the new e-commerce platform needed seamless integration with backend order processing applications, ensuring a frictionless shopping experience. Extensive regression and end-to-end testing were critical to ensuring system reliability, transaction security, and performance across multiple platforms and devices. To accelerate testing cycles, improve accuracy, and ensure scalability, the client sought an advanced test automation framework tailored to their core business processes.

Solutions

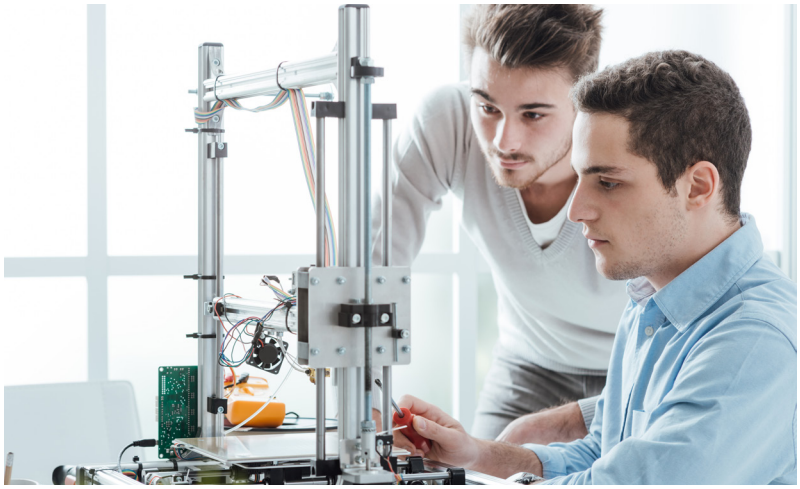
- Developed Hybrid Test Automation Framework using AFTA 4.0 with Python.
- Used Python (Selenium), PyTest, and Azure Pipelines for automation.
- Integrated TestMu AI for cross-browser/ device testing.
- Enhanced debugging with Allure Reports and centralized object repository.
- Enabled parallel execution, retry mechanisms, and end-to-end validation.

Results

- 90% reduction in regression testing time.
- 88% reduction in testing effort per release.
- 80% decrease in regression testing costs.
- 50% faster automation of new test cases.
- Scalable, cloud-based execution with real-time testing.

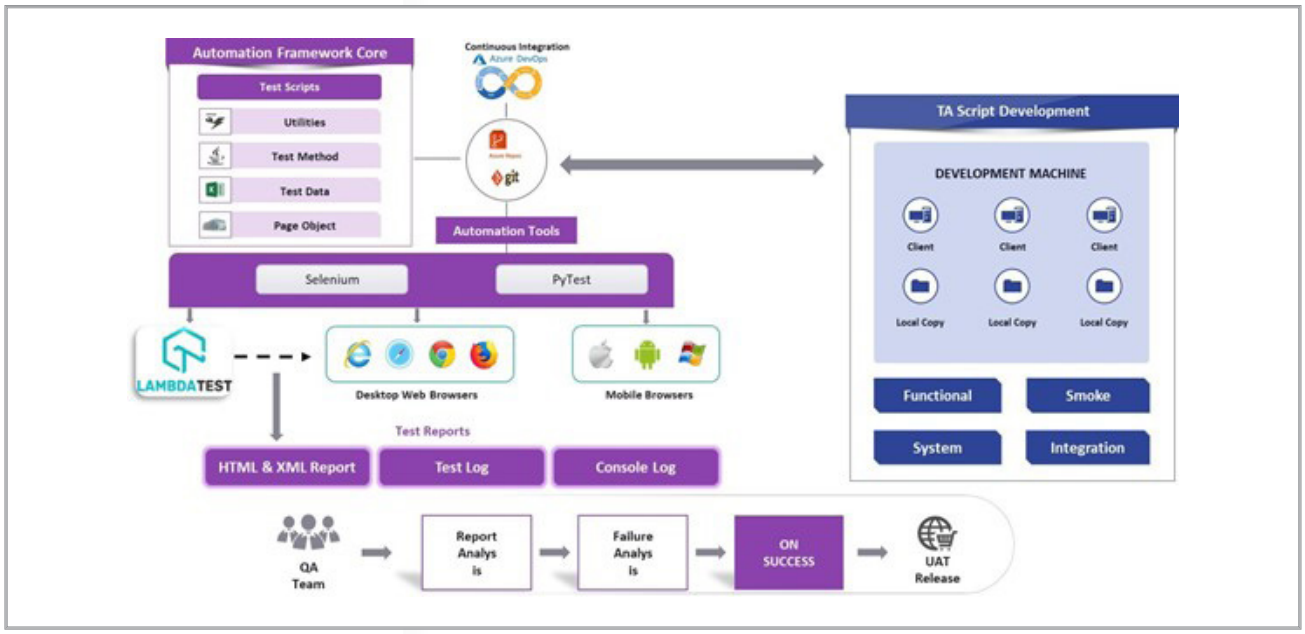
Business Challenges

The client's manual regression testing process was inefficient, requiring 10 person-days per cycle, making it too slow for rapid releases. Their e-commerce application needed seamless cross-platform compatibility across multiple devices, browsers, and screen resolutions. A scalable and maintainable automation solution was essential to support business growth while minimizing long-term costs. Additionally, testing had to cover diverse devices, including the latest iOS and Android models, with various screen resolutions. Integration with backend order processing systems had to be defect-free, and automated testing needed to be embedded within the CI/CD pipeline to ensure faster, more reliable releases.



Aspire Solution

To address these challenges, Aspire Systems **designed and implemented a custom Hybrid Test Automation Framework- using our homegrown AI-powered test automation accelerator AFTA 4.0**- integrating Page Object Model (POM) and Data-Driven Testing (DDT) for maximum scalability and efficiency.



Key Highlights of the Solution

Technology Stack: Developed using Python (Selenium-based automation), ensuring flexibility and ease of integration.

Framework Optimization: Leveraged PyTest for its plugin compatibility and CI/CD integration capabilities.

CI/CD Implementation: Integrated with Azure Pipelines to automate test execution at various development stages, enhancing code quality and release speed.

Cloud-Based Cross-Browser Testing: Implemented TestMu AI for real-time and virtual device/browser compatibility testing, reducing infrastructure dependency.

Enhanced Debugging & Reporting: Integrated Allure Report to streamline test result analysis and improve collaboration.

Scalable & Reliable Execution: Enabled parallel execution and retry mechanisms, ensuring tests run efficiently across multiple environments.

End-to-End Validation: Ensured comprehensive QA coverage, reducing defect leakage and accelerating time-to-market.

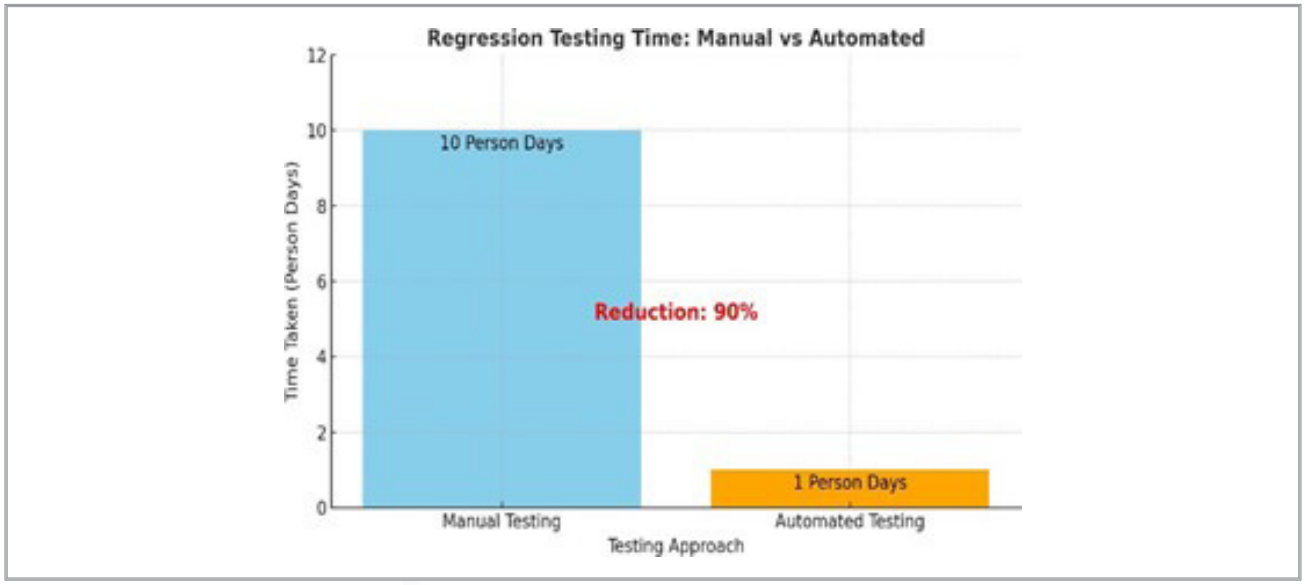
Total Testcases Vs Automated

- **Total Testcases:** 660
- **Regression Testcases:** 450 (Out of 660 Testcases)
- **Automated RT cases:** 400 (90% automated out of total 450 TCs) (375 + 25 E2E TCs)
- **Regression Coverage in each release:** 330+
- **Automation coverage:** 83% remaining 17% manual Execution
- **Build Validation Test:** 60 cases (Automated 45 - Manual 15)

Technology Snapshot

- » **Application Type:** Web
- » **Programming Language:** Python
- » **Version Control Tool: Azure** Repo
- » **Defect Tracking Tool:** Jira
- » **Continuous Integration Tool:** Azure Pipeline
- » **Development Environment:** PyCharm (PyTest)
- » **Execution Environment:** TestMu AI, Azure
- » **Reporting Tools:** PyTest-HTML Report, Allure Report
- » **Value Added:** Support for multiple platforms and mobile web applications

Key Benefits & Business Impact



- 90% reduction in regression testing time, significantly accelerating release cycles.
- 50% faster automation of new test cases using reusable components.
- 88% reduction in regression testing effort per release, optimizing QA team productivity.
- 80% reduction in regression testing costs, leading to long-term operational savings.
- Achieved comprehensive test coverage across iOS, Android, and various screen resolutions.
- Enabled real-time cloud-based execution via TestMu AI, reducing hardware dependencies.
- Centralized Object Repository for easier UI updates.
- Improved Code Reusability and separation of test logic from UI elements, simplifying debugging.
- Easier Scalability for future feature additions.

How the Framework Made Maintenance Easier

- **Centralized Object Repository -** All locators for a specific page are stored in a single class (the page object class). If a UI element changes, you only need to update the locator in one place, reducing maintenance effort.
- **Improved Code Reusability -** Reduces duplication and makes the test scripts shorter and easier to manage.
- **Separation of Test Logic and UI Elements -** Test scripts contain only the test logic, while the page objects manage the UI interactions. This clean separation makes debugging and updating tests much simpler.
- **Easier Scalability -** Adding new tests for a page is straightforward, as the page object class already contains the required locators and methods. This reduces the time and effort needed to write new tests as the application grows.
- **Debugging -** Issues are easier to trace because test scripts are not cluttered with low-level details. Problems can be quickly identified as either related to the test logic or the page object.

Using the above features in the framework, approximately 50% of maintenance efforts could be reduced:

Automation Script Type	Traditional Framework Maintenance (Hrs)	Aspire's Optimized Framework (Hrs)	Effort Reduction
Simple	1	0.4	60%
Medium	1.5	0.75	50%
Complex	3	1.25	58%
Average Efforts reduced in maintenance using this framework			**56%**

What's the effort & cost reduction:

Testcase Category	Total TCs	Manual Efforts (Hrs)	Automation Efforts (Hrs)
Regression Testcases	375	98	10
E2E Testcases	25	16	4
Total	**400**	**114**	**14**

Future Impact

Aspire's test automation framework has positioned our client for long-term efficiency, scalability, and cost savings.

- **Faster Release Cycles:** Automated testing reduces validation time from 10 person-days to a few hours per cycle.
- **Improved Defect Detection:** 60% fewer defects leaking into production, reducing costly hotfixes.
- **Scalability & Future Expansion:** The framework can easily scale with new business requirements and product updates.
- **Lower Maintenance Costs:** Automation ensures sustainable cost savings for future regression cycles.

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Aspire Systems is a global technology services firm serving as a trusted technology partner for our customers. We work with some of the world's most innovative enterprises and independent software vendors, helping them leverage technology and outsourcing in our specific areas of expertise. Our core philosophy of "Attention. Always." communicates our belief in lavishing care and attention on our customer and employees.

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