



**AUTONOMOUS TESTING ENABLES AGILE
DEVELOPMENT FOR THE FEDERAL GOVERNMENT**

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1. Testing at Scale is Broken

Building complex systems requires talented people, streamlined processes, and cutting-edge technology. However, agencies are shackled to their current processes and forced to spend an increasing amount of their budget on operating and maintenance. Moreover, most available talent is poured into creating the newest feature, letting efficient processes fall by the wayside. As the complexity of systems grow, teams require a scalable and maintainable system to automate testing if they hope to remain agile. The current model of test automation requires teams to choose between labor cost, speed, and coverage. They must manually maintain their automation, taking away from development resources.

To solve this, AutonomIQ and Techflow have partnered to deliver autonomous testing to government agencies so software development, testing, and release teams can manage this complexity and immediately free up budget to deliver innovation.

We envision the initial impact of AI to optimize the software testing life-cycle, before disrupting other parts of the life-cycle. The three areas in which AI will disrupt the software testing life-cycle are as follows:

1. AI will synthesize vast amounts of natural language requirements and descriptions to automatically generate test cases.
2. AI will determine the right test scripts to be generated autonomously to ensure the application can be tested for the right test cases.
3. AI will process all the changes that are going on across the application landscape, and autonomously keep all the software testing assets in sync with those changes.

Our end-state vision for AI in software testing is a world where, AI agents will automatically learn code and predict software bugs before they occur, and automatically heal them if they are missed in the prediction process.

2. Key Testing Challenges at Government Scale

Project managers and applications owners are caught in a seemingly impossible situation, as the business demands faster delivery functionality, without compromising quality, while keeping the delivery and project costs flat, and still watching existing O&M costs balloon.

Our assessment of the challenges faced by development teams include the following:

- a. **Deliver transformation projects faster without compromising quality.** It is relatively straightforward to implement “green-field” projects, but government agencies have complex processes integrated with other application landscapes. Identifying all the test scenarios, creating the testing assets, and finally executing them consumes at least 30-40%

of delivery time. With the pressure to get more from IT, the need to free up time-repetitive tasks is more important than ever.

- b. **Manage testing through constant changes.** Managing all the testing artifacts across release cycles is a constant struggle. Previously, change came from the centralized dev team. Today, IT teams must deal with change from internal sources, APIs, SaaS integrations, cloud infrastructure changes, and on and on. Elite enterprise dev and testing teams are severely challenged by the intensity and frequency of change management. To survive, IT needs to leverage intelligent automation to keep up with the changes.
- c. **Government applications are often mission critical and therefore must have highest quality.** Government applications are mission critical in providing services for the common good and running the country efficiently. There's no room to compromise quality when it comes to delivering services to US citizens or managing state and local funding. Because of this, agencies are facing more pressure to deliver value through IT but can't afford to make a mistake, leading them to manage byzantine processes instead of focus on new development or modernizing their application landscape.

3. **A New Approach for Testing Mission Critical IT Systems**

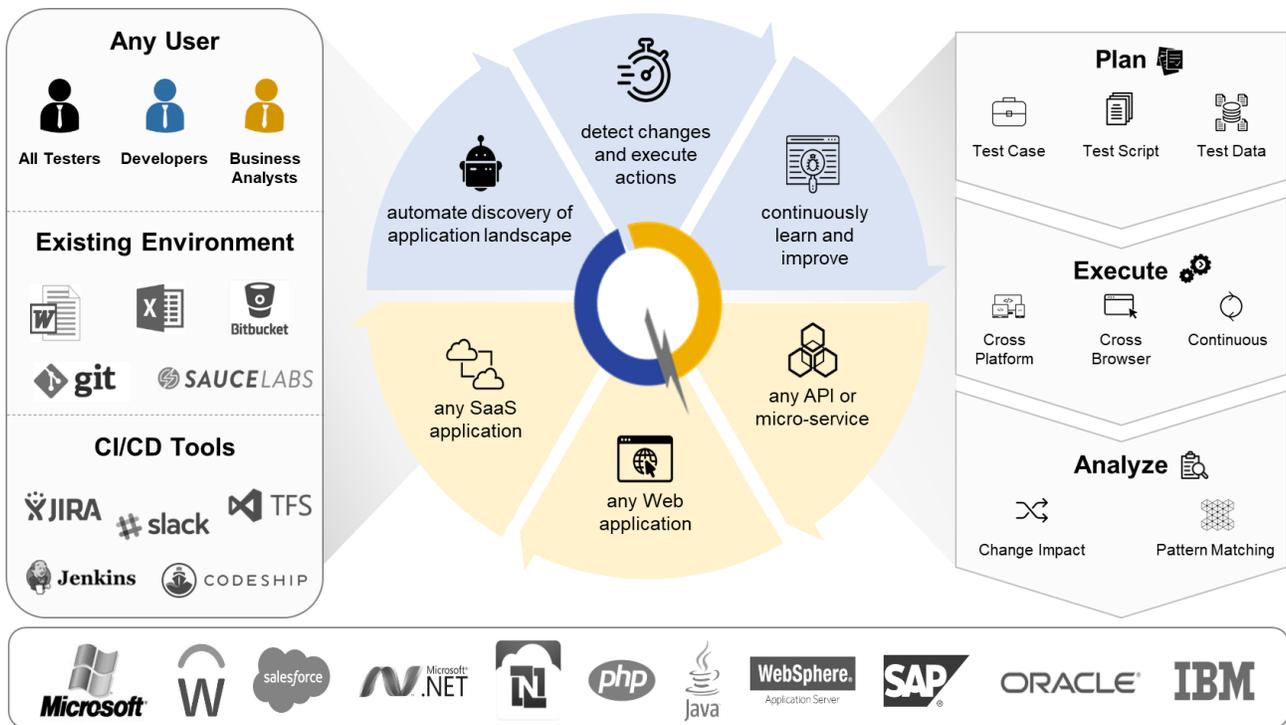
The legacy approach to using manual testing and previous-generation test automation frameworks aren't enough to address the quality challenges of critical IT systems. Even using modern CI/CD or dev-ops approaches is only a partial solution because this just shifts many of the same software testing challenges to a different implementation-and-upgrade methodology.

Instead, IT leaders need to strike at the heart of the matter – a reinvention of software testing. We need software testing approaches that can autonomously manage the testing life-cycle, by auto-generating testing artifacts for Fusion and autonomously executing them through the life-cycle of the project.

This new approach to software testing has to make “software testing” appear as if it were inherently integrated into the implementation-and-upgrade cycle, made available and instantly executed at scale and on-demand as soon as code commits occur.

4. **Autonomous Testing for Government Agencies**

Agile development requires companies to focus on frequent releases, moving at a high velocity, and continuously improving the process. Leveraging AutonomiQ's Autonomous Testing Platform, TechFlow is able to develop higher quality solutions much faster. So how does autonomous testing affect development?



a. **Autonomous Generation of Test Artifacts**

The Autonomous Testing platform automatically generates all the test artifacts required for executing tests. This includes test cases, scripts, and test data. All the artifacts are generated at the time of code commit and integrated into the Fusion developer workflow.

This reduces test analyst and test automation labor required to understand, validate, write, troubleshoot and tune the various testing artifacts, freeing testing resources to work on higher value tasks.

b. **Autonomous Self-Healing of Test Artifacts**

The Autonomous Testing platform constantly maintains the state model for the applications under test, and all the changes occurring across the application landscape. This could be in the form of changes from within project team, from external sources like API changes, third party upgrades, and other integration points.

AutonomIQ's AI engine constantly gathers all the changes occurring in the application landscape for Fusion environments and automatically modifies the right test artifacts required for executing tests. This includes test cases, scripts, and test data. All the artifacts are constantly synchronized with the changes occurring in the environment in real time.

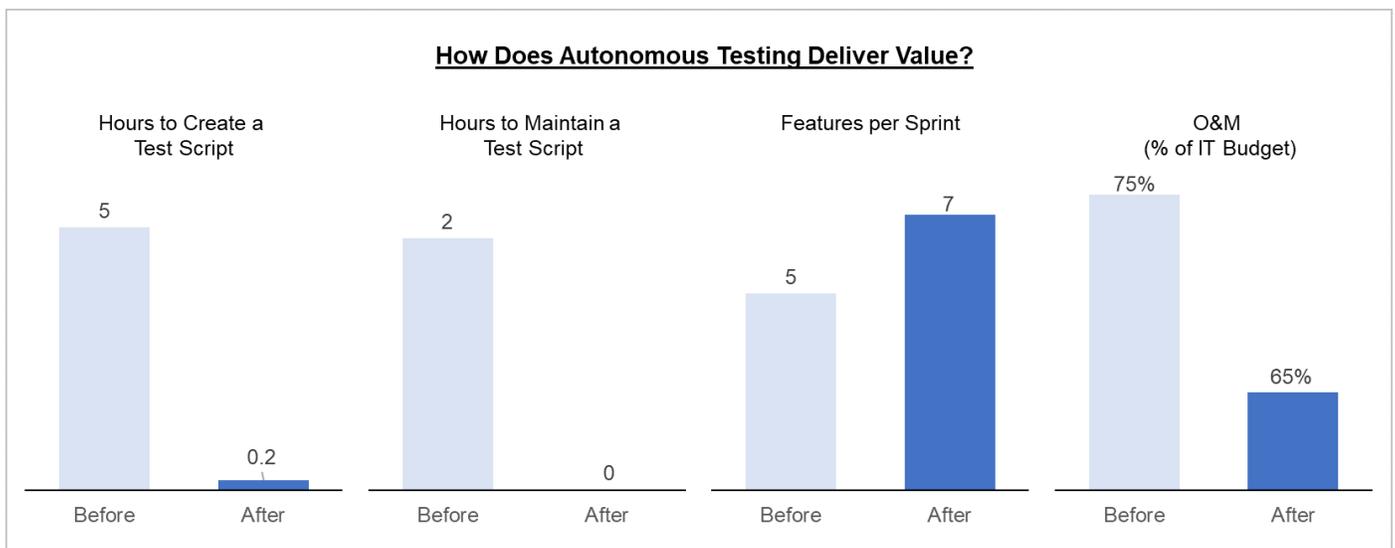
This reduces the amount of manual work and effort involved in detecting, correlating, analyzing, and updating all the test artifacts. Instead, these tasks are completed autonomously for you.

c. **Autonomous End-to-End Business Process Validation**

One of the key challenges of development with large scale IT footprints is ensuring the integrity of the end-to-end business process. The Autonomous Testing platform autonomously configures business processes and ensures that the testing scenarios address the end-to-end business process testing scenarios. This ensures that the large implementation or upgrade project delivers the business process scenarios that business users are going to use on the final outcome.

Moreover, the Autonomous Testing platform continuously executes regression tests across complex processes to ensure full coverage during development. By continuously executing tests, teams can find defects in real time, ensuring defects don't make it to production, and quickly eliminating production scenarios resulting from interactions with external systems.

d. **Delivering Value at Scale**



So how does autonomous testing create value for agile development teams at scale? It slashes the time it takes to create automation from hours to minutes and allows companies to spend almost no time maintaining it though self-healing capabilities. From this, companies can spend more time developing, slash O&M from their budget, all while getting full coverage. By taking time out of the development cycle from testing and maintenance, companies can test more and develop more for the same cost.

Moreover, autonomous testing allows agencies to confidently embrace new types of projects, allowing them to confidently modernize and rationalize their application portfolio without worrying about failing to test a single part of their mission critical processes.

5. Conclusion

Agencies face the imperative to modernize their application landscape, develop mission critical services, and deliver more value through IT, all with a flat budget. AutonomIQ and Techflow's autonomous testing solution is the only solution that enables agencies to transform their application landscape, leveraging AI and machine learning in an effective manner to transform their software testing life-cycle, all while using the saving to pay for new initiatives. With autonomous testing, agencies get the best-in-class experts managing their complex end-to-end processes at scale, enabled by artificial intelligence and autonomous technology.

About AutonomIQ

AutonomIQ is a cloud platform that enables product and IT teams to autonomously test, release, and deploy software, thereby increasing the speed of software releases without compromising on quality. With pre-built integrations to common web applications and SaaS providers, customers can instantly create test cases, generate test scripts, test data, and execute tests. Using deep-learning and AI algorithms, AutonomIQ detects changes, enables self-healing for test assets, and provides advanced diagnostics. In real-world situations, AutonomIQ has been shown to provide over ~50% improvement in speed and quality compared to existing tools and techniques.

About Techflow

Founded in 1995 at the start of the dot-com revolution, TechFlow helped large commercial firms such as Dreamworks, Toshiba, MGM, and others modernize their business systems using what has become known as Agile At Scale development. Today, with deep operational roots in the bi-coastal innovation hubs of California and Washington DC, TechFlow continues as a leader in applying innovative engineering, technology, and integration solutions to the Government's most demanding mission and business challenges, delivering impactful ingenuity on a government scale. www.techflow.com