Test Automation… Automated

Because we practice what we preach!

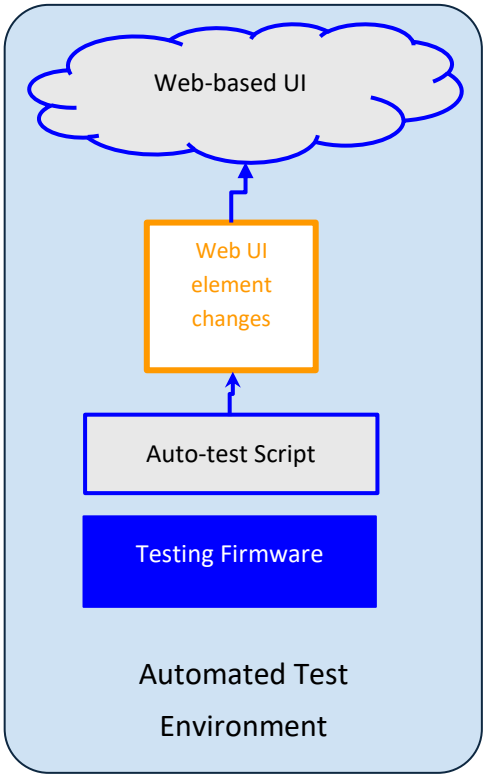
A self-healing code… decoding the breakthrough.

Like a digital phoenix, web elements rise anew.
In cyber-embrace, they mend & renew.
Autonomous. Resilient structures... glitches bid adieu.

Jasmin Info-tech has a portfolio of services under TaaS (Testing as a Service). This includes Web Test Automation.

With significant experience gained over 20 years of delivering testing services to a marquee list of global clients, we at Jasmin Infotech have brought in several innovations.

The Smart Test Automation (**STA**) was defined through iterative testing cycles of platforms and multi-generational products. For our customers, this meant huge resource savings, including the capability of remotely conducting tests and automating regular procedures.

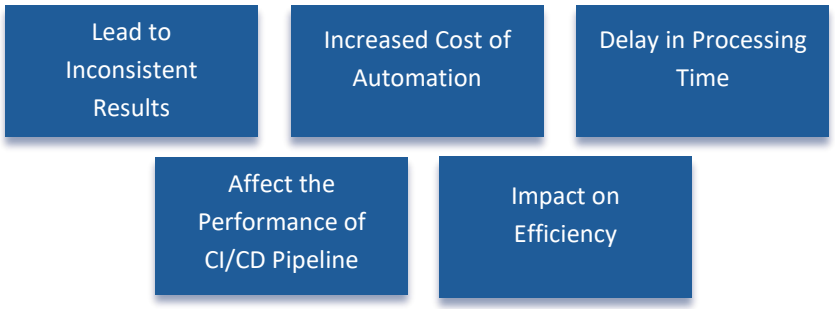


Web-based automation is a highly effective, testing architecture deployed to further empower the test-teams.

Dynamic changes in web elements

Web-automation involves creating custom test firmware mapping to specified web applications, which controls the web-based testing service.

In this ever-evolving landscape of web applications, frequent changes to web UI elements are inevitable. However, such alterations often introduce vulnerabilities and disruptions in the testing firmware, leading to degraded experiences and increased maintenance efforts in the test firmware. This is time-consuming, test effectiveness is reduced, there is a possibility of creating false alarms, and resources need to be allotted to monitor the test execution.

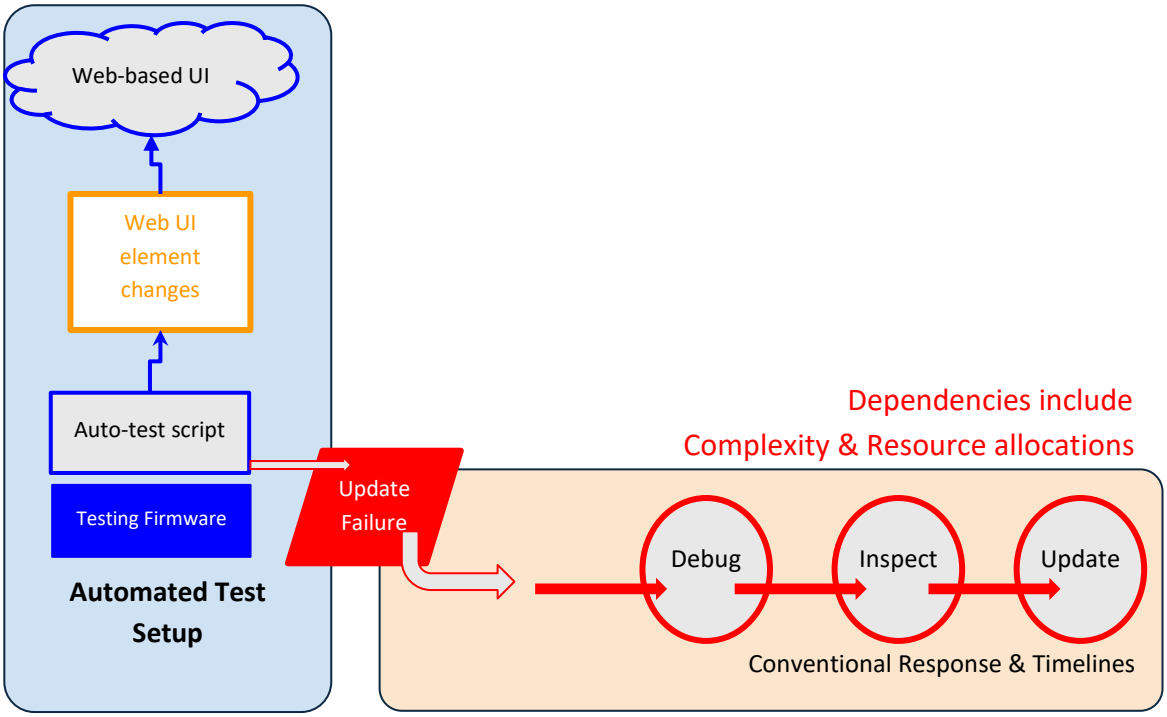


Challenges of web automation tests due to dynamic changes in web elements.

The fix may be minor, but the wait may be long.

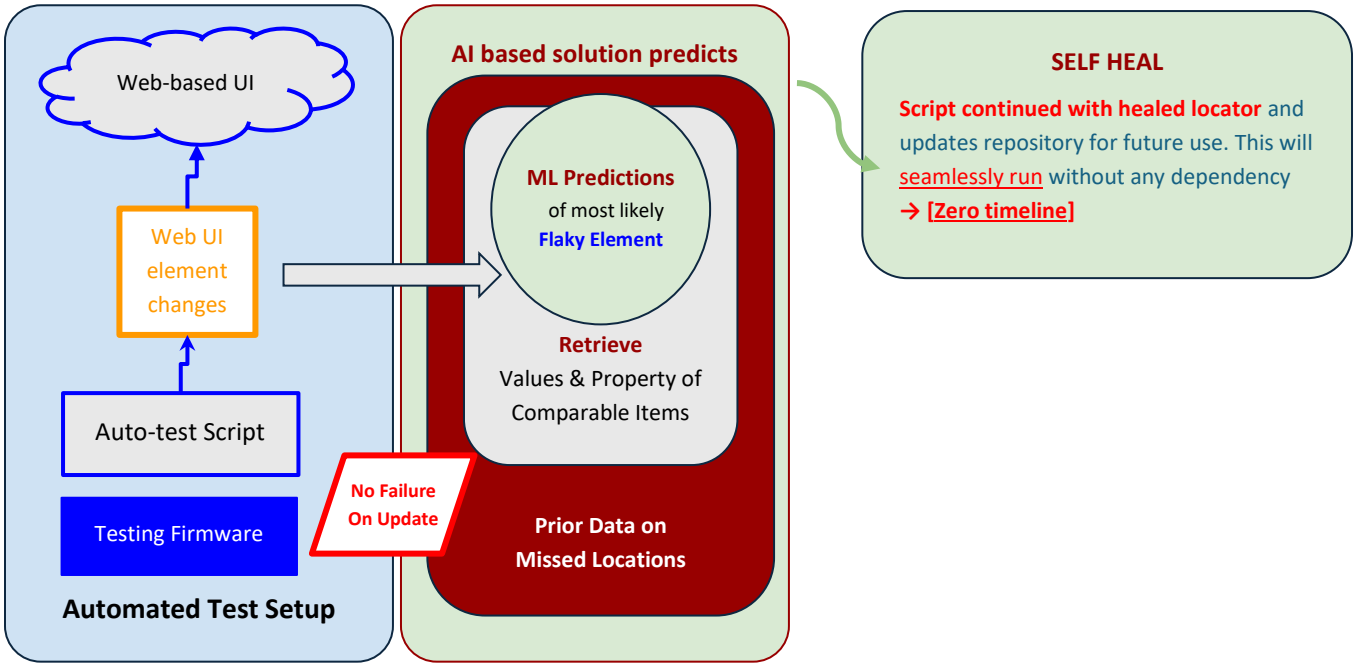
When a test firmware breaks at the Smart Test Automation Framework, manual element identification maintenance can take up to 15 to 20 minutes per occurrence [it can vary depending on the constraints]. An automation engineer has to stop writing the new test firmware in order to troubleshoot and fix the broken ones. After manually inspecting or spying on the element to determine the new locator value or to locate new locators to employ, the team updates the repository or test firmware and runs it again. The amount of time needed to modify broken test cases will depend on constraints like complexity, resource delayed availability, etc. It, therefore, has an impact on the automation process's

efficacy and efficiency. This necessitates proactive strategies to automatically detect, adapt, and recover from modifications.



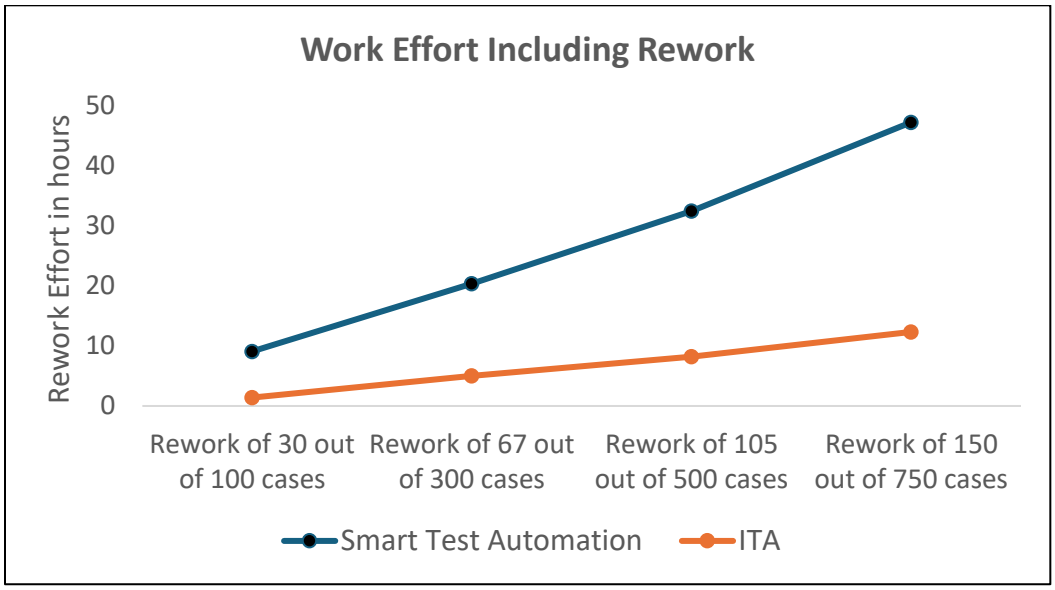
Machine Learning (AI) adds a self-healing web-layer

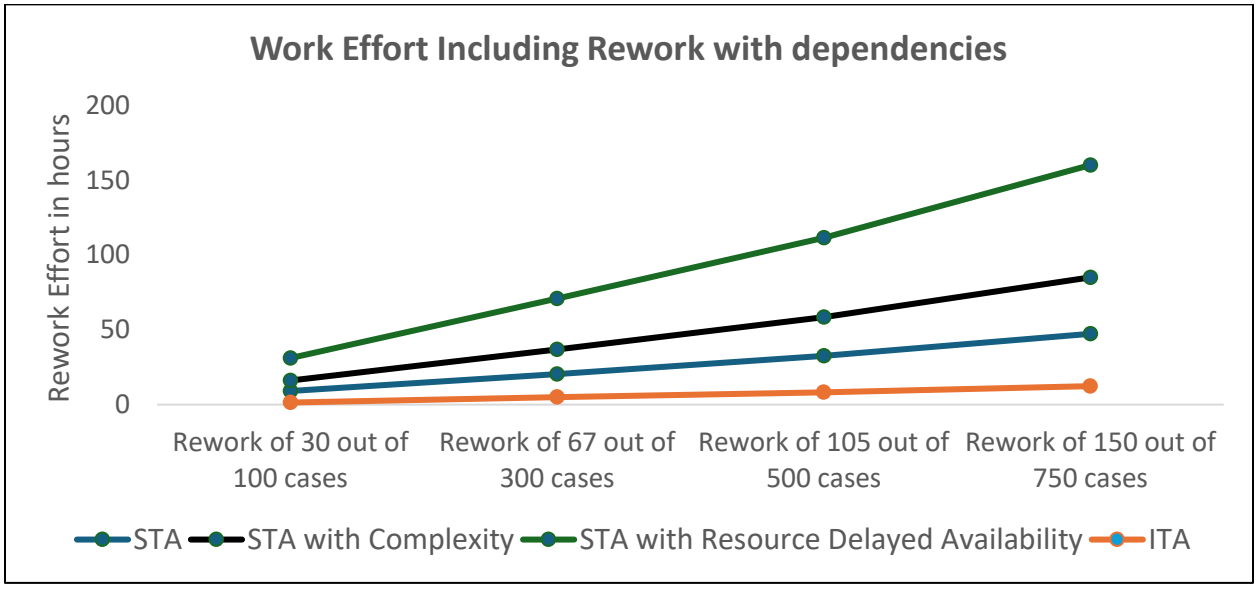
A robust process for web element changes is imperative to ensure uninterrupted testing and streamline development workflows. Examining the difficulties encountered while testing the web-automation and maintaining the test firmware, the team came up with a Machine Learning model enabling autonomous healing procedure. Thereby resolving the glitches before they can surface.



Intelligent Test Automation Framework (ITA)

The Intelligent Test Automation algorithm that we have created will automatically repair broken locators at runtime by adding the self-healing web layer to the framework. A UI element can be located via a variety of locators in web applications to automate the functionality of that element. These locators include ID, name, Xpath, CSS locator, class, tag, link text, and partial link text. One or more locators for a UI element may change depending on the circumstances, and the ITA handles these changes successfully with the help of machine learning. So, the testing firmware will run seamlessly without any dependencies. It integrates the machine-learning algorithm with a proxy server and database to achieve this effectively. It in turn reduces the amount of manual effort. Further, total effort is always increased in STA systems with the inclusion of rework effort.

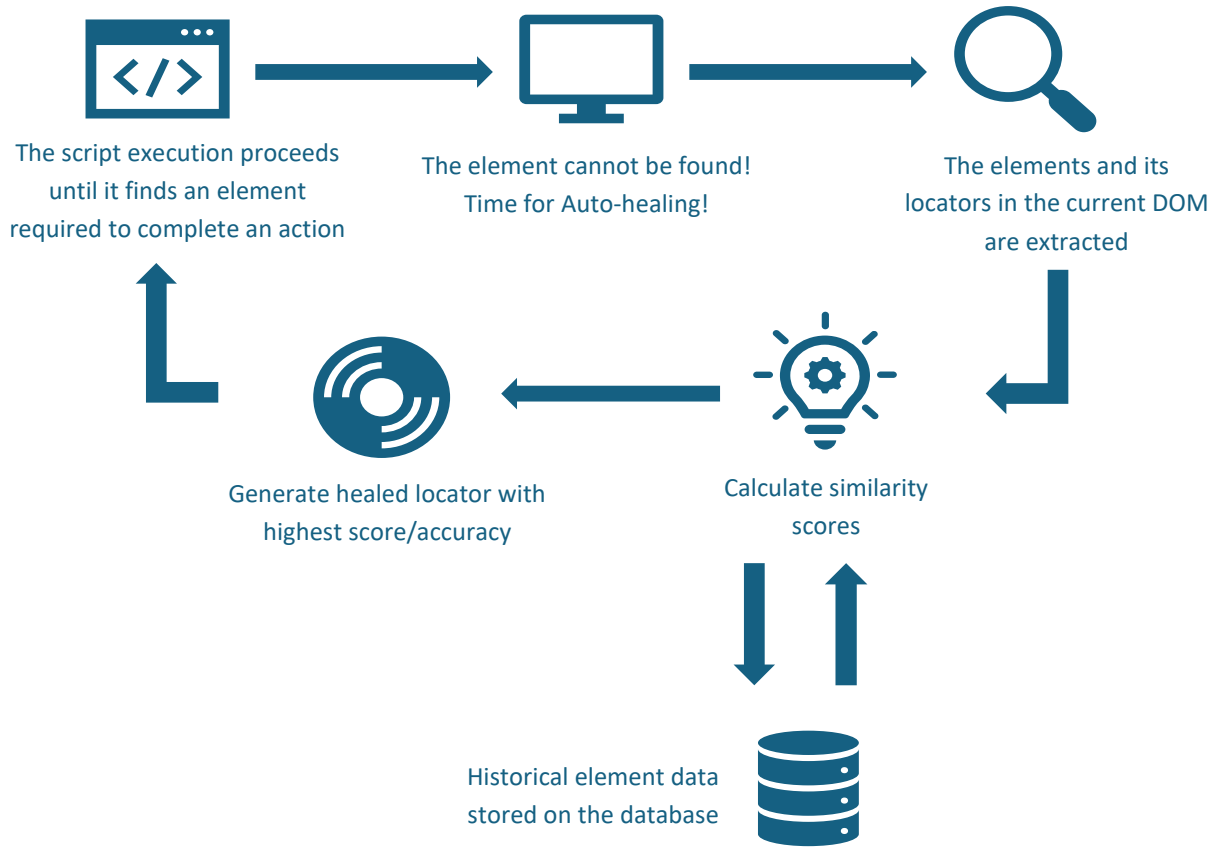




The Autonomous healing process:

How does the ITA really work. It uses the autonomous healing process to handle the dynamic changes in web elements. When an element cannot be found (due to a locator name or value change), the failed element is fetched from a historical

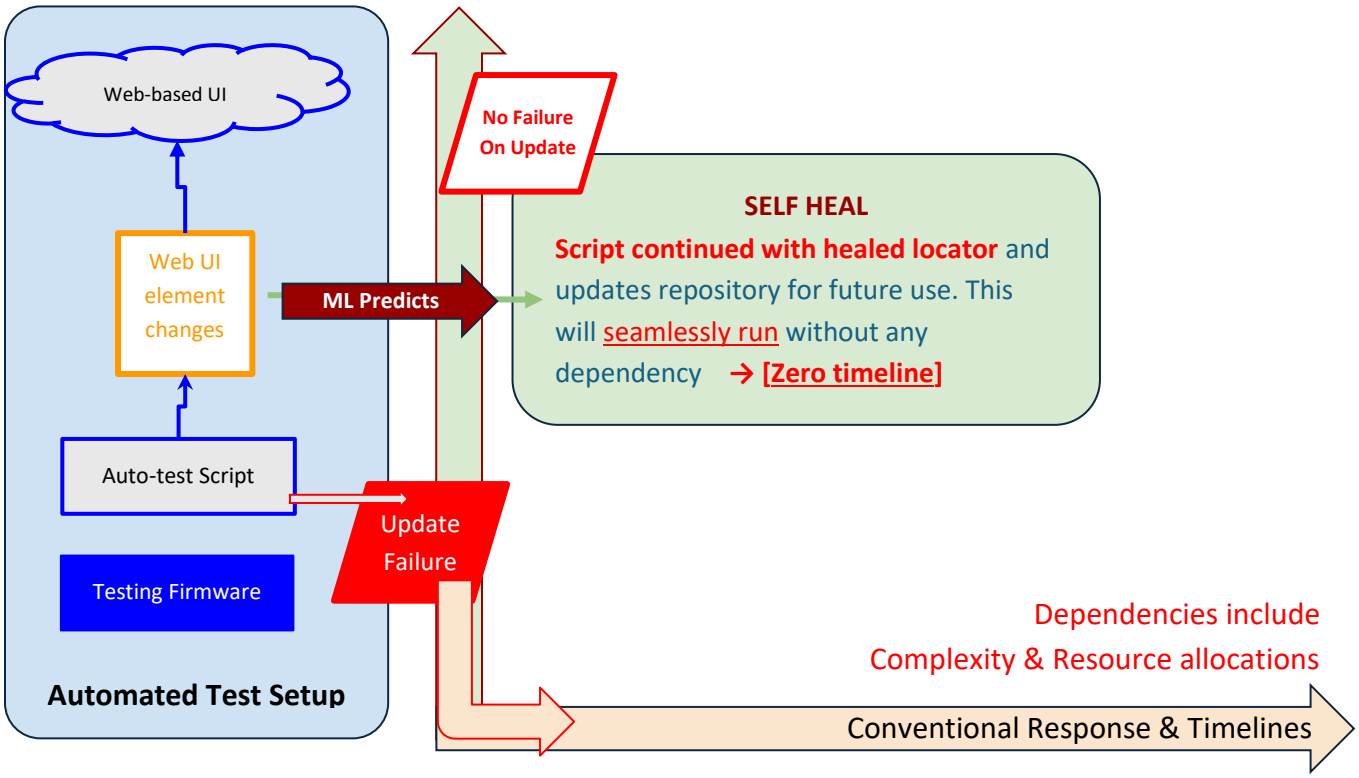
object repository file, along with all its locator names and values. All similar objects (such as all other text boxes) that do exist on the page are scraped, including all their locators and values, and then the autonomous healing will use various similarity scoring algorithms to evaluate how similar each property is between the missing historical element and the available element on the page. Finally, the autonomous healing process will return the element and its locators with the highest score for use. The test firmware can then attempt to identify the new element, continue on in execution, and update framework repositories with the new element information, as long as everything works.



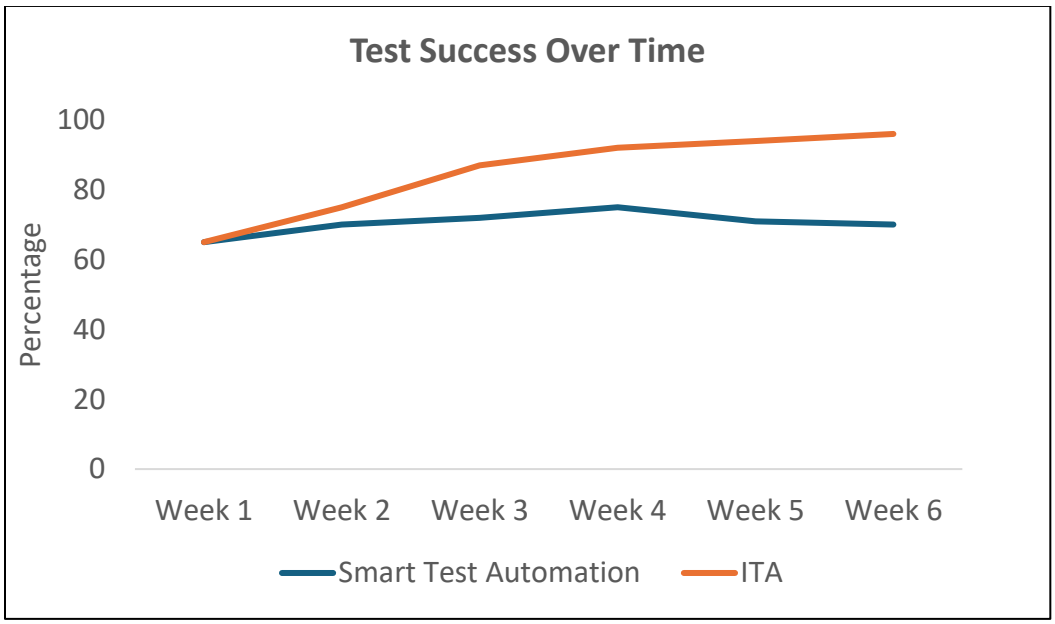
The STA system always returns a result of "Pass" or "Failed," but it does not take into account aspects that vary in real time, like dynamic web elements, while

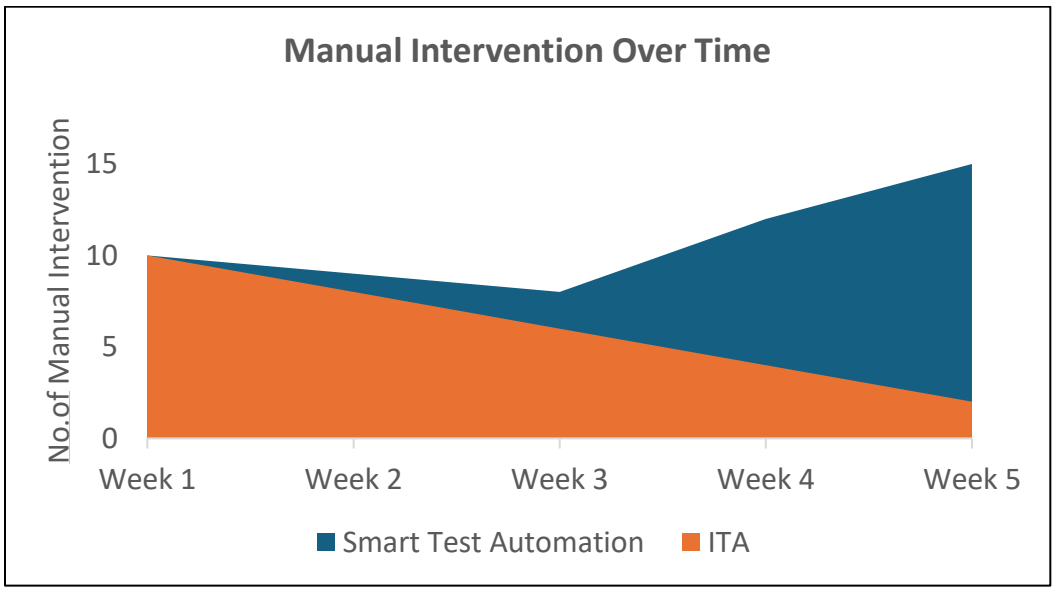
making that decision. However, the Intelligent Test Automation framework with autonomous healing process makes use of machine learning to increase its effectiveness and makes decisions based on the consideration of changing dynamic components.

Workflow comparison of the STA and ITA



This will affect the success rate of the system in CI/CD pipeline when the pipeline incorporates with STA. The success rate will either decrease or remain flat in the event of any changes or successive builds. However, the Intelligent Automation Framework made the decision by including the dynamic factors, so the success rate is high over a period of time. Including this process at the CI/CD pipeline improves the quality of the code, and the build can be chosen for the next level of testing with more confidence.





When compared to the Intelligent Test Automation (ITA) system, the traditional automation system typically requires more manual effort and intervention and is more expensive. On the other hand, the ITA consistently offers higher accuracy and better efficiency with minimal intervention.

ABOUT JASMIN EMBEDDED SOFTWARE TESTING TEAM

Jasmin Infotech's embedded software testing team has perfected the skill of testing with over two decades of delivering testing services to plenty of customers around the world.

The categories served range from networked, Audio Video Consumer, Professional, Pro-consumer products. From standalone units to now cloud delivered products & services.

DISCLAIMER

Earlier generations of products were relatively less complex with limited functionalities, use cases, and technology blocks.

However, as software and system components become more intricate, integrating intelligent test management systems into existing test automation solutions or customer's development lifecycle to improve test coverage and boost test efficiency.

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