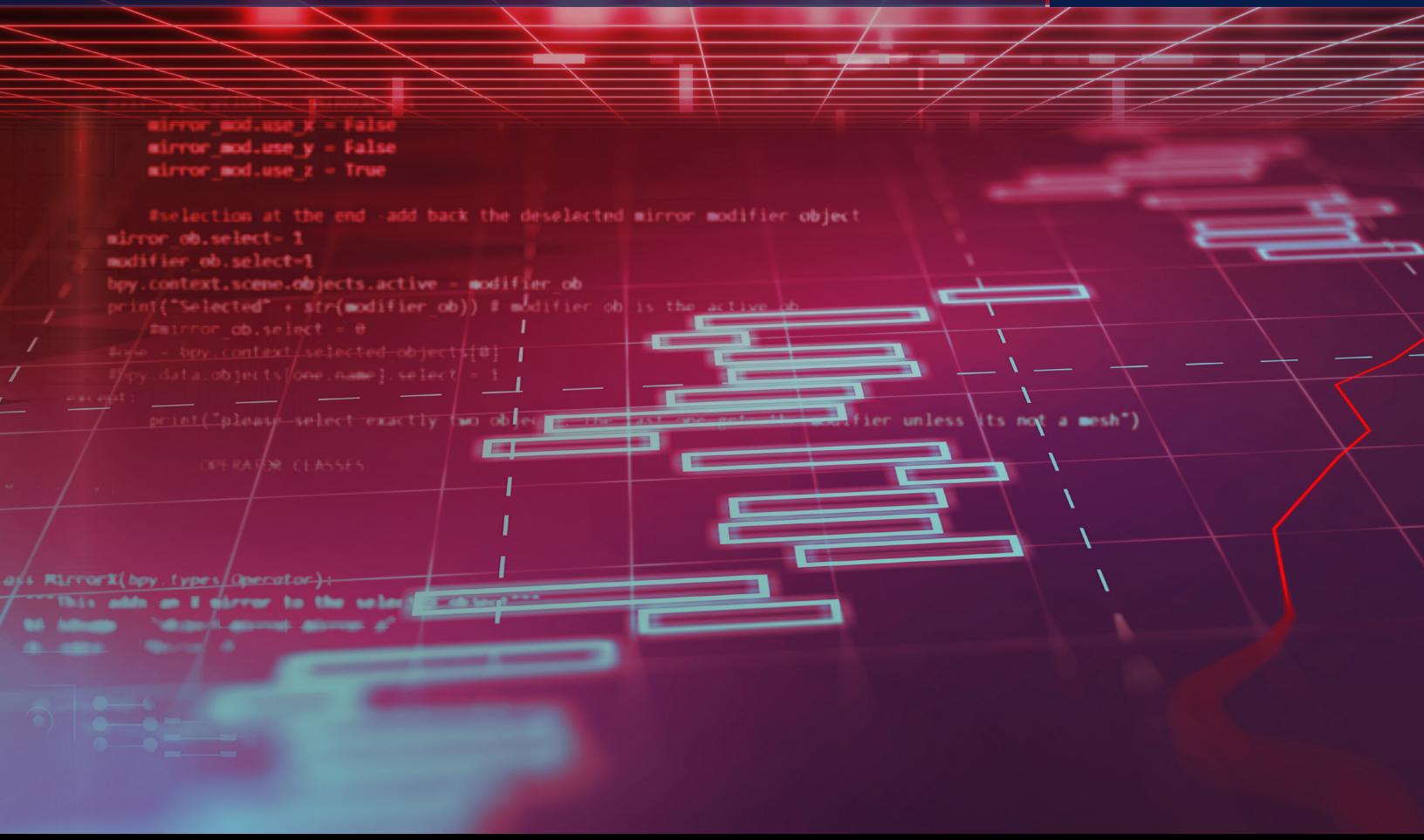
CASE STUDY



Software Test Automation Speeds User Interface Testing

Up to 6x faster software testing

KEYSIGHT

Background

PathWave Instrument Robotic Process Automation (RPA)

- Keysight PathWave Instrument RPA enables hardware development engineers to stay connected while driving up productivity and collaboration through intelligent workflow automation of a single instrument / DUT connection.

Solutions

- Repetitive, manual UI testing does not account for every possible user journey.
- Software must work consistently across PCs and instruments.

Solution

- Keysight Eggplant Test

Results

- Accelerated software testing by up to 6x
- Reduced defects found in production by 80%
- Improved overall software quality

Introduction

Rapid technological advancements coupled with increasing consumer demand and expectations are compelling businesses to push out new products and updates to remain competitive. Development happens at such a quickened pace that keeping up with quality assurance (QA) testing often becomes a challenge.

In this case study, we demonstrate how Keysight used its own software test automation solution, Keysight Eggplant Test, to accelerate regression testing of the Keysight PathWave Instrument Robotic Process Automation (RPA) software solution.

Challenge: Testing User Interfaces Across Multiple Devices

User interfaces can act differently depending on the user, device, and other factors. The complexity of tests also increases as software becomes more complex.

PathWave Instrument RPA is software that works on both PCs and instruments, and this presented a unique QA challenge for the software development team: ensuring the software works as expected on both a PC and an instrument.

Prior to adopting Eggplant Test, the team's approach consisted of manual regression testing, colloquially called point-and-click testing. The team would repeat the same steps over and over, manually clicking through hundreds of user journeys.

> In the beginning, we did manual testing, but we had to keep repeating the same process again and again, which took up too much time.
>
> **Neaven Seo**, R&D architect for PathWave RPA at Keysight Technologies

Not only is this an inefficient use of time, but manually testing the UI does not scratch the surface of all the possible journeys a real user could take. This approach addresses only the happy paths, leaving the team vulnerable to shipping the product with unaddressed defects.

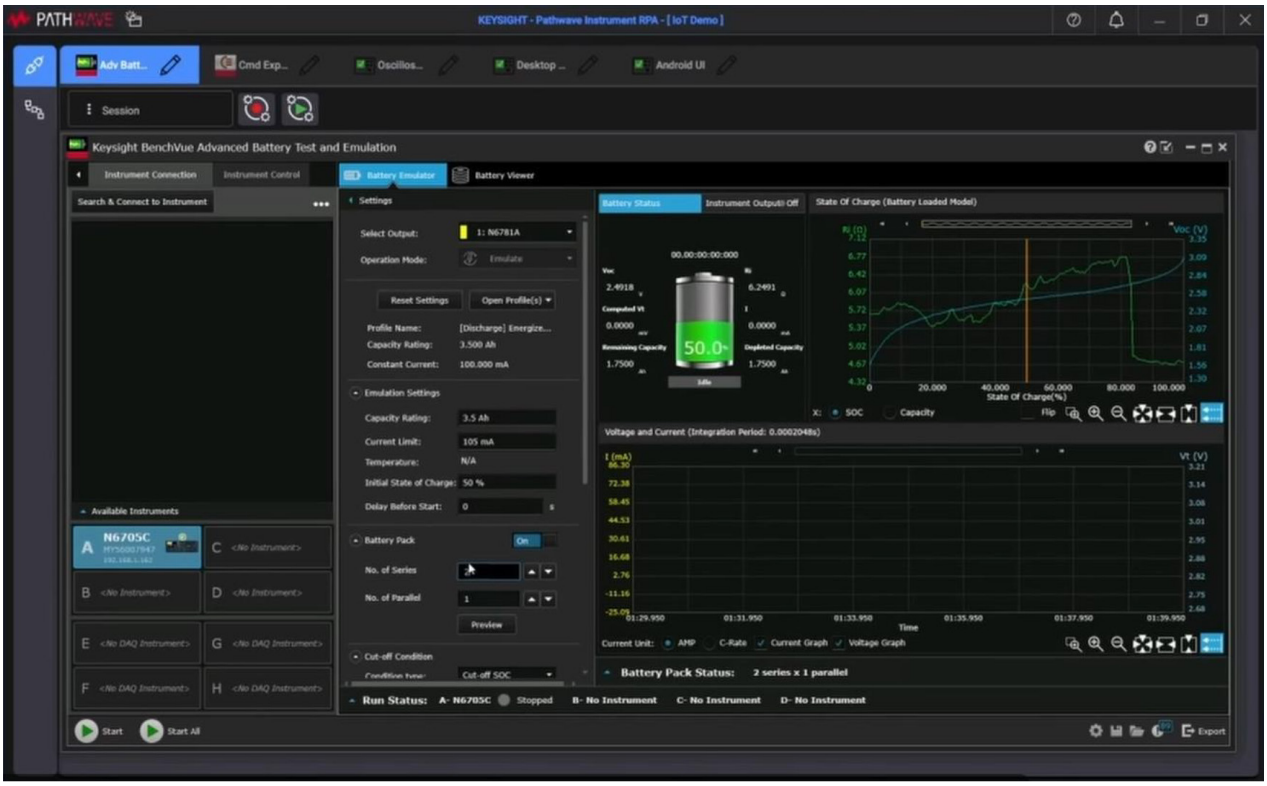


Figure 1. PathWave Instrument RPA user interface

Solution: Automated Software Testing

Driven by the need to accelerate UI testing, the software engineering team looked to Eggplant Test, which provides intelligent automated testing at the UI level.

Testing from the user's perspective

Eggplant Test can interpret and interact with the UI of the system under test (SUT), viewing the application from a real user's perspective. Using advanced computer vision, Eggplant performs the same reliable point-and-click testing that a human tester would perform, but at a much faster rate.

Creating a digital twin of the application

With Eggplant Test, the team created a digital twin of PathWave RPA software. By proactively clicking around the SUT, Eggplant can evaluate novel user journeys and potentially uncover bugs that linear tests or manual testers might miss. Because Eggplant automatically executes these tests, it's easy for QA teams to document and retrace the steps that led to bugs.

> Instead of having QA engineers manually click away at all the buttons on the software, we automated the testing process using Eggplant to iterate through all the possible paths a user could take.
>
> **Neaven Seo**

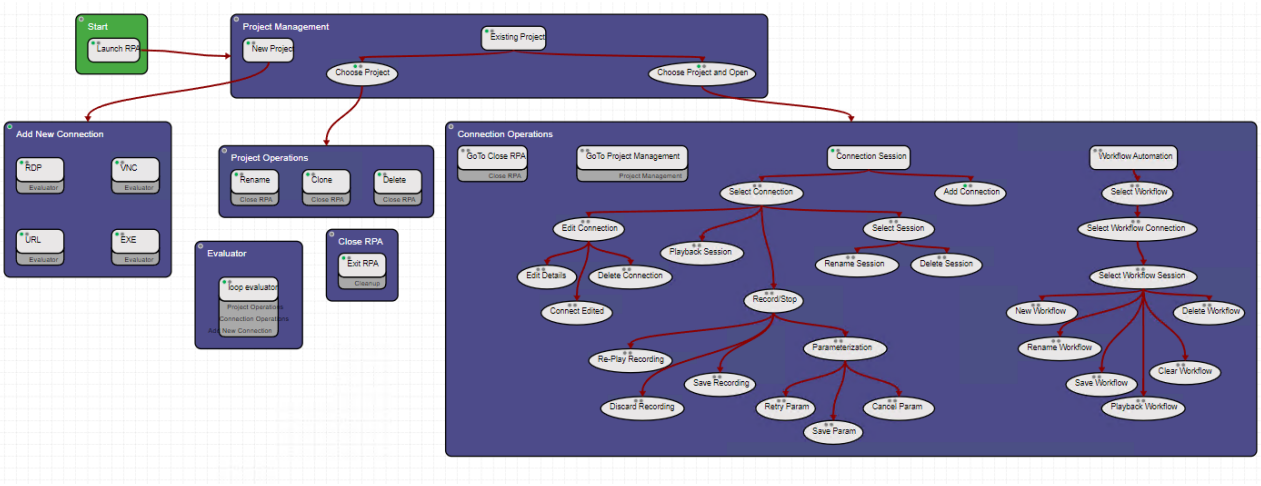


Figure 2. Eggplant Test creates a map of all possible user journeys in PathWave instrument RPA

Results: Accelerated Regression Testing, Time Savings, and Higher-Quality Software

Implementing Eggplant Test improved test speed and accuracy. Compared with manually testing the UI, which covered only 5 to 10 test cases per day, the team can now automate UI testing of up to 20 test cases per day.

Table 1 shows example test cases. When testing manually, the engineering team spent over an hour on a single test case. With Eggplant, the same test case takes 12.5 minutes to complete — a 6x improvement.

Table 1. Manual test time vs. test time with Eggplant Test

Manual test time (without Eggplant)	Test time (with Eggplant)	Improvement	Test case
80 mins	12.5 mins	6x faster	Create new RDP, VNC, EXE, and URL project test conditions
40 mins	11.7 mins	3x faster	Select existing project and rename the project with test conditions
40 mins	13.3 mins	3x faster	Select existing project and clone the project with test conditions

Additionally, automated exploratory testing further enhances software quality by ensuring that all possible user paths undergo thorough testing. Before Eggplant, the team would typically report 19 defects in production, but now that number is down to four — a nearly 80% decrease in software defects.

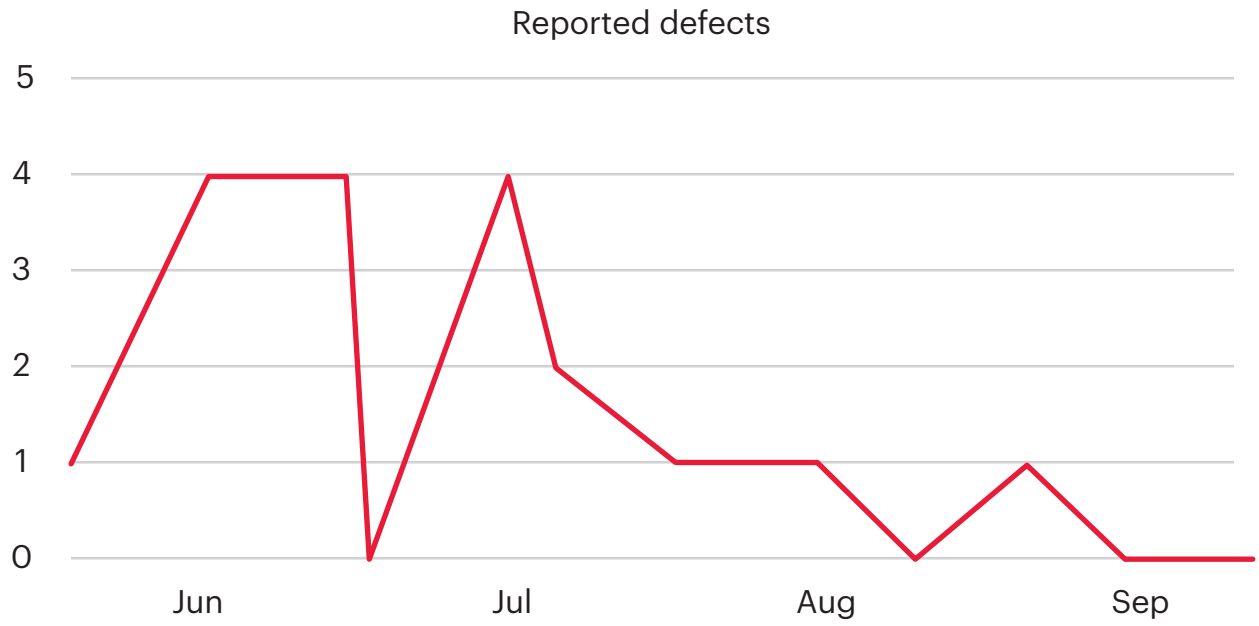


Figure 3. The decline in reported defects with test automation

Conclusion

Keysight Eggplant Test has enabled the engineering team for PathWave Instrument RPA to automate the testing workflow for the PathWave Instrument RPA user interface. The team broke free from repetitive, manual UI testing and was able to test every possible user journey, improving overall software quality.

For more information

- Learn more about Keysight Eggplant Test.
- Find out more about PathWave Instrument RPA.