TEST STUDIO

CASE STUDY

Vistaprint – how a global marketing services giant created a unified automated testing platform with Telerik

Vistaprint

With three different QE automation platforms being used by their 100-strong worldwide testing team, Vistaprint needed to create a strategic solution that would support their future development needs. Here Clay Bogusky, QE Technology Manager and Harish Narayan, Director, Technology at Vistaprint, tell how they tackled the mammoth task and brought it to a successful conclusion – with a little help from Telerik.

OVERVIEW

REGIONAL
Global

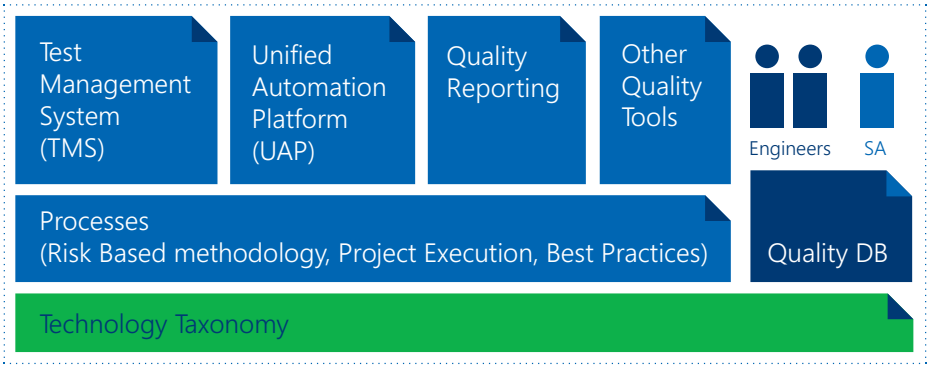
INDUSTRY
E-commerce, online printing, micro business marketing

CUSTOMER PROFILE
Vistaprint (NASDAQ: VPRT) provides affordable, professional print and online marketing tools for small businesses in 130 countries worldwide.

CHALLENGE
Inspired by the vision of a Quality Platform to support business activities across the organization, Vistaprint set out to replace its three existing QE automation platforms with a single, unified QE automation platform.

SOLUTION
Vistaprint chose to leverage the Telerik Testing Framework, part of the Test Studio family, a framework for writing automated tests for HTML5, AJAX, Silverlight and WPF applications, ahead of automation frameworks from Microsoft and Selenium

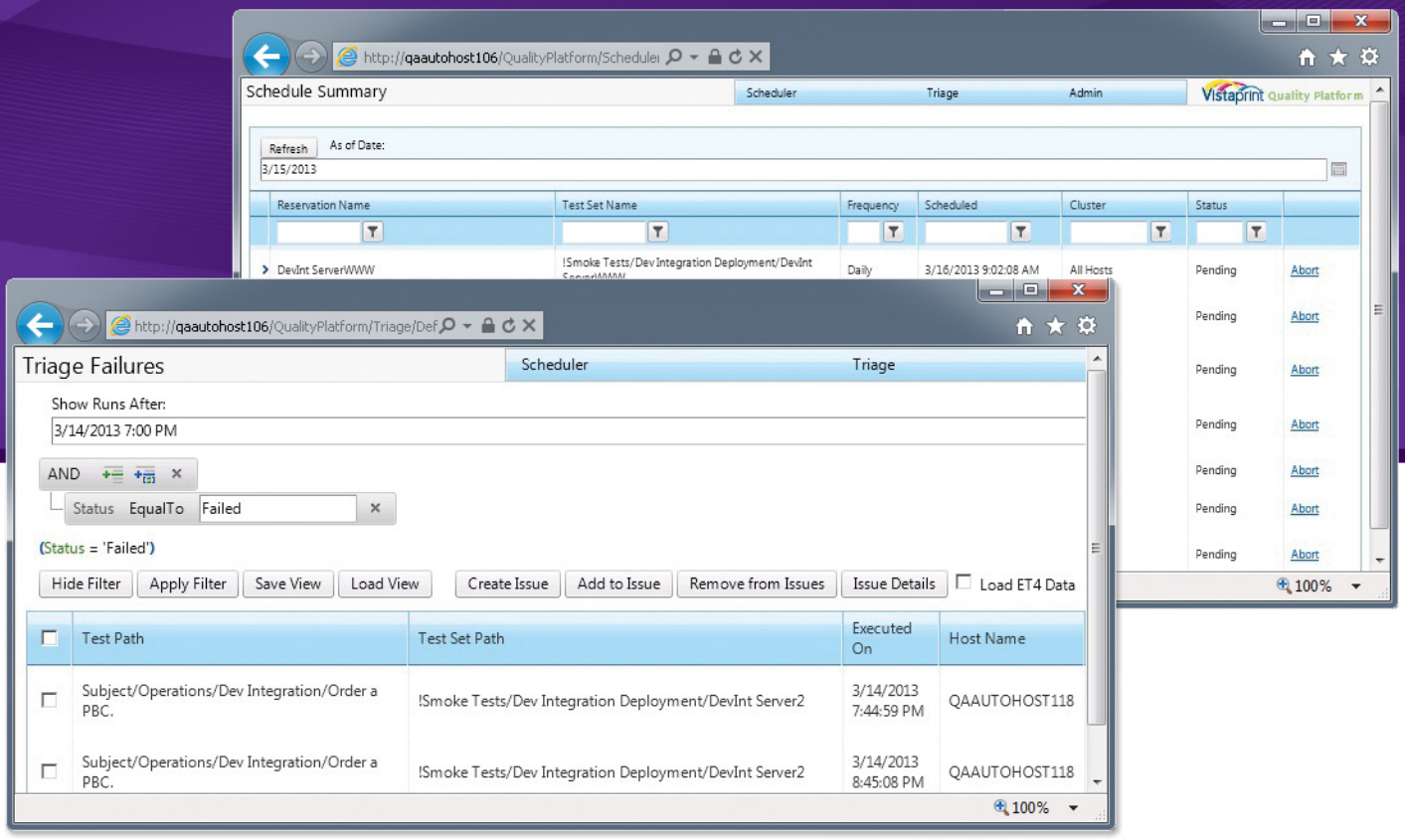
BENEFITS
- Support for major browsers as well as WPF and AJAX applications
- Professional assistance delivered through the Telerik support package



The Vistaprint Quality Platform

> "The Telerik Testing Framework has been an invaluable resource for us in creating automated tests for Vistaprint."
>
> Clay Bogusky, QA Technology Manager at Vistaprint

telerik



BACKGROUND

Why did you need to undertake this project?

A couple of years ago, Vistaprint had three separate and independently operating automation platforms that were used to validate our solutions. Two of the three platforms were used for the majority of the testing. These two platforms used the WebAii/Telerik framework. Each of these platforms had advantages and disadvantages but none could scale for the long-term without extensive increase in maintenance cost. In total, there were over a million lines of code and over 6,000 automation test programs across all three platforms.

An initiative began to replace these three systems with one unified automation platform. This was part of a wider vision to create a quality platform to support business activities throughout the organization.

To give us a sense of scale, how many tests and how many people are involved?

Automated tests

- 6,000 on the legacy platforms.
- A few thousand and counting on the new unified platform.
- Each test can have many configurations and parameters, leading to 3 to 5x more actual test runs.

Staff involved

- Vistaprint has hundreds of developers worldwide.
- Approximately 100 of them are members of the Vistaprint QE department.
- 5 “core” automation test script developers on one team.
- A few QE engineers inside various QE teams that develop automated tests as needed.
- 5 software engineers including a solution architect developing the platform and tools for automation.

How long did the project take?

The development of the unified platform started in April 2011, its first version was deployed by April 2012 and migration of automated test scripts began shortly thereafter.

THE CHALLENGE

Building a new platform on this scale is a daunting prospect. Can you give us a high-level overview of the technology challenge?

Our automation platform consists of several modules and subsystems or frameworks to ensure flexibility and scalability. The main modules in the platform are:

- Automation script "runner"
- Scheduler services and UI
- Automation dispatcher
- Automation triage services and UI
- Admin services and UI
- Management and monitoring

The main subsystems are:

- Common framework
- Test framework
- Business-layer frameworks
- Scheduling framework
- Triage framework
- Admin
- Management framework

The platform uses HP's ALM product as the test management system for designing and executing tests manually or by using automation. We have used Telerik's RadControls for ASP controls for increased capabilities, performance, and reduced development time. Presently, we have over 100K lines of Vistaprint code in the platform excluding test scripts. This excludes the Telerik Testing Framework.

At the heart of the platform are the common frameworks that are used to automate the applications under test. We have defined a single UI automation interface that is used to test console as well as browser based user applications. This interface is used to test all Vistaprint developed applications.

Each automation script uses the common framework to test a Vistaprint application. At this point, we have completely migrated off of the legacy platforms.

What technologies have you used?

We are principally a Microsoft shop (Windows OS) and use the .NET stack. We code in C# and use the Powershell scripting language for some administrative tasks. Our web site is developed in ASP.NET and MVC technologies for generating orders. The backend systems are coded in WinForms and WPF.

As a result of acquisitions and expansion, open source technologies are being used but automation projects on those applications have not yet started.

CHOOSING TELERIK

How did you decide to use Test Studio and the Telerik Testing Framework? What were your criteria?

We are using the Telerik Testing Framework because it fits our needs to develop automated tests for the .NET technology. It was the only

> "We chose Telerik for its extensive technology support, including various browsers, WPF, AJAX and JavaScript. Our browser and windows automation layers extensively leveraged the Telerik Test Framework, enabling us to deliver our automation platform on-time with multi-technology support".
>
> Harish Narayan, Director, Technology at Vistaprint

framework that claimed to support the most widely used browsers (IE, FF, Chrome, and Safari), as well as WPF and AJAX applications. Telerik also offers a support contract which has been helpful in resolving bugs and answering questions in a timely manner.

What other tools and/or frameworks did you evaluate?

We reviewed the Microsoft and Selenium automation frameworks. The Microsoft framework was limited to the products Microsoft sells (ie WPF). When we evaluated Selenium its features were largely limited to browser based automation.

GETTING IT DONE

What impediments did you identify ahead of time?

Since our staff was very knowledgeable with the WebAii project and had already automated thousands of tests, we were well prepared to seed the Unified Automated Platform.

However, we knew that we had to build a platform that could scale and grow over time. To do that, we grew a team of software engineers with a solution architect. We made the case and secured budget to do so. In addition, we secured budget to procure a VMware "farm" of automation hosts that can execute automated tests for years to come.

How did you adjust your project's timeline or scope to include time for automation? Were your initial estimates close?

Our initial estimate to develop the new unified platform was approximately one year with 4.5 engineers and another year to rewrite automation and retire the legacy systems using 5 engineers.

Our estimates were fairly accurate. The most difficult part was finding qualified people for the project since it was a unique venture. We have retired all of the legacy systems.

How did you set expectations with your team and leadership regarding the work for automation?

Fortunately, we set expectations appropriately during the funding cycle of the project. After the project was approved, we set quarterly milestones with clear interim deliverables, and provided frequent updates on the status of the project.

All stakeholders (development team and management) were very well informed. Everyone played a part in the process until we rolled out the first deployment of the new platform and automated tests. Of course, we had early adopters that helped pave the road for the project.

How closely did your automation developers work with your system developers?

The Vistaprint QE organization was the primary customer for the Unified Automation Platform. During the beginning stages of the development

TELERIK'S DEEP EXPERTISE IN TESTING

Telerik Testing Framework has its roots in the respected WebAii testing framework, dating from 2006. WebAii was created to meet the growing need for testing to be able to handle AJAX and Rich Internet Applications. Involvement with Telerik began with native support for Telerik's UI controls in 2009. When the team joined Telerik in 2010, WebUI Test Studio was released, evolving into today's Test Studio with the introduction of support for WPF applications, as well as load and performance testing.

The Telerik Testing Framework and Test Studio were developed hand-in-hand by the same dedicated team. Telerik Test Studio provides an intuitive UI, sophisticated recording capabilities and the ability to share test results directly between QE and developer teams, speeding the development cycle. Test Studio follows Telerik's aggressive release cycle with regular updates and new features, and Test Framework is updated alongside Test Studio with each release.

Test Studio and the Telerik Testing Framework are used extensively by Telerik product teams in perfecting Telerik's legendary components and widgets. Building on Telerik's drive for product reliability and outstanding customer care, the Telerik testing solutions offer best-of-breed support and learning resources to ensure customer success in the field of test automation.

of the platform, the QE organization played a major role in providing the requirements with the solution architect. As the project progressed into coding phase of the project, we kept the QE organization abreast of changes in meeting the requirements.

As we deployed the unified platform in phases, the automation team created automation programs/ scripts to test the system. After we had a "bake off" between the legacy and new automation platform, the automation team fully engaged with the new platform writing new, efficient and well-designed automation programs.

Did you alter your system in any way to make it more automation-friendly?

Not so much, though we are now developing more interfaces and APIs, which can be leveraged for automation. One of the guiding principles for the new platform was to increase the efficiency of creating automation scripts. Therefore, we created robust frameworks that were easy to piece together. These frameworks were designed in layers based on unique subsystems. At the top layer, we created the business frameworks that used one or more foundational/infrastructure frameworks.

To test our website, our QE organization is roughly divided into separate functional groups that tests specific website capabilities. For example, one group tests payments and another tests the ordering process. We built group-specific helper methods into our business frameworks to make automation easier. For example, one such helper function is a PayPal page handler that logs in with a specific PayPal user ID.

What sorts of infrastructure/ backing frameworks did you develop to help support your automation efforts?

We created several infrastructure frameworks and some are listed below.

- Browser UI framework: Offers an abstraction layer for testing browser based applications. Uses the Telerik testing framework.
- Windows UI framework: Offers an abstraction layer for testing WinForms or WPF applications.
- Common Framework: Offers class libraries with utilities of such generic value as to be useful to automation scripts across functional areas.
- Administrative framework: This subsystem administers the UAP automation farm and also UAP services.

Mobile Automation framework: Offers an abstraction layer for testing browser based mobile devices such as Android and the iPhone.

What were the two biggest impediments to implementing automation on your project and how did you overcome them?

Two challenges were creating/ designing modular effective tests

that needed to be automated, and accurately defining the business layer frameworks. Overcoming the test design problems required significant amounts of training on effective test design and with the new platform. It was a significant cultural change for most of the people in QE since most teams had embedded practices for creating tests that they were using for several years. We overcame the business layer requirements by continuously meeting with end users of the system, through the development process and refining the design and code over time.

What major problems did you find with maintainability/stability of your test suite?

There are always changes with applications under test. The automation that deals with regression tests changes relatively infrequently. However, we initially spent significant maintenance time updating element IDs, triaging network problems, browser differences, and other misconfigured tests. Over the past year, we have implemented various fail-safe mechanisms to assure stability. The automation farm uptime has been upwards of 98 percent.

How much effort was required for ongoing care and feeding of your test suite?

There are always updates based on application changes that require changes to the automated tests and/or business frameworks. These changes take up most of the team's maintenance time. However, compared to our legacy systems, and based on the architecture and design of our unified platform, overall cost of maintenance has reduced significantly.

THE RESULT

What were the biggest gains you found using Telerik?

By using the Telerik Testing Framework:

- We saved an enormous amount of time and effort, since we were familiar with the product, and it met our varied needs.
- We incorporated this framework into our single UI framework.
- We were able to test using recent versions of IE and FF.

How do your stakeholders feel about the value of automation?

The organization places a high value on automated testing as it is efficient and helps with faster time to market. Everyone is supportive of automation efforts since they identify approximately 8-10 percent of defects. The new platform has been adopted successfully. We are starting to see a reduction in time to maintain, thereby increasing the ROI of our automation efforts.

The first version of our triaging tool is helping in timely triaging and will continue to reduce the cost of ownership of automation. The new platform is also extensible and can test web services APIs as well as UI based applications.

What kind of ROI are you seeing?

Though still early, here's what we have seen so far:

- Use of templates and configurations, has helped many teams see up to 75 percent reduction in number of tests written and automated.
- Automation team's effectiveness has doubled over the past 18 months.
- Time spent on maintenance reduced by 10 percent.

What were the biggest lessons you learned in this project?

The following are some key takeaways:

1. Management must realize the effort involved in building such a platform. It requires significant investment in people, capital budget, and cooperation across the company.
2. Capture and confirm requirements, design, code, review and repeat in small increments. In building a new platform, ensure that it is architected for flexibility, scale and robustness.
3. Tool selection is critically important. Features, flexibility, meeting the requirements, and having a roadmap are very important.
4. Ensure that you have stable test environments. It is difficult to execute automation successfully in a highly dynamic environment.

What would you have done differently, and are you applying that to future automation efforts?

Overall, we have successfully deployed a quality automation platform that scales well with our business. Using automated UI testing has been done at Vistaprint for many years. The new platform has standardized the way QE automated tests are designed and executed. Since we have a three week release cycle, it took more time than expected for people to adapt. As we move forward, we will focus more on "white box" testing vs. "black box" testing, and extending our platform to support continuous integration and development-level testing.

THE VERDICT

To sum up, how would you describe your experiences with Telerik?

The Telerik Testing Framework has been an invaluable resource for us in creating an automation solution for Vistaprint. Without it, our efforts would have been much more limited and would have taken significantly longer to accomplish. Telerik's support for the framework has been very valuable and has considerably reduced time required to create automated tests.

ABOUT VISTAPRINT

Vistaprint N.V. (Nasdaq: VPRT) empowers more than 15 million micro businesses and consumers annually with affordable, professional options to make an impression. With a unique business model supported by proprietary technologies, high-volume production facilities, and direct marketing expertise, Vistaprint offers a wide variety of products and services that micro businesses can use to expand their business. A global company, Vistaprint employs over 4,100 people, operates more than 25 localized websites globally and ships to more than 130 countries around the world. Vistaprint's broad range of products and services are easy to access online, 24 hours a day at www.vistaprint.com.

ABOUT TELERIK TEST STUDIO AND THE TESTING FRAMEWORK

The Telerik Testing Framework is the free test automation framework from Telerik, makers of Test Studio – the one-stop solution for functional, performance, load and mobile testing. The Telerik Testing Framework helps automate AJAX, Silverlight and WPF applications. Users benefit from rich API, LINQ support, browser abstraction, special wrappers for Telerik RadControls and integration with unit testing frameworks such as VS Unit testing, NUnit, MbUnit and XUnit.

ABOUT TELERIK

Telerik is a market-leading provider of end-to-end solutions for application development, software testing, agile project management, reporting, and content management. Telerik's award-winning software development products enable enterprises and organizations of every size to generate tangible productivity gains, reduce time-to-market, and stay on time and under budget.

With tens of thousands of users in more than 90 countries around the world, Telerik's customers include numerous Fortune 2000 companies, academic institutions, governments, and non-profit organizations.

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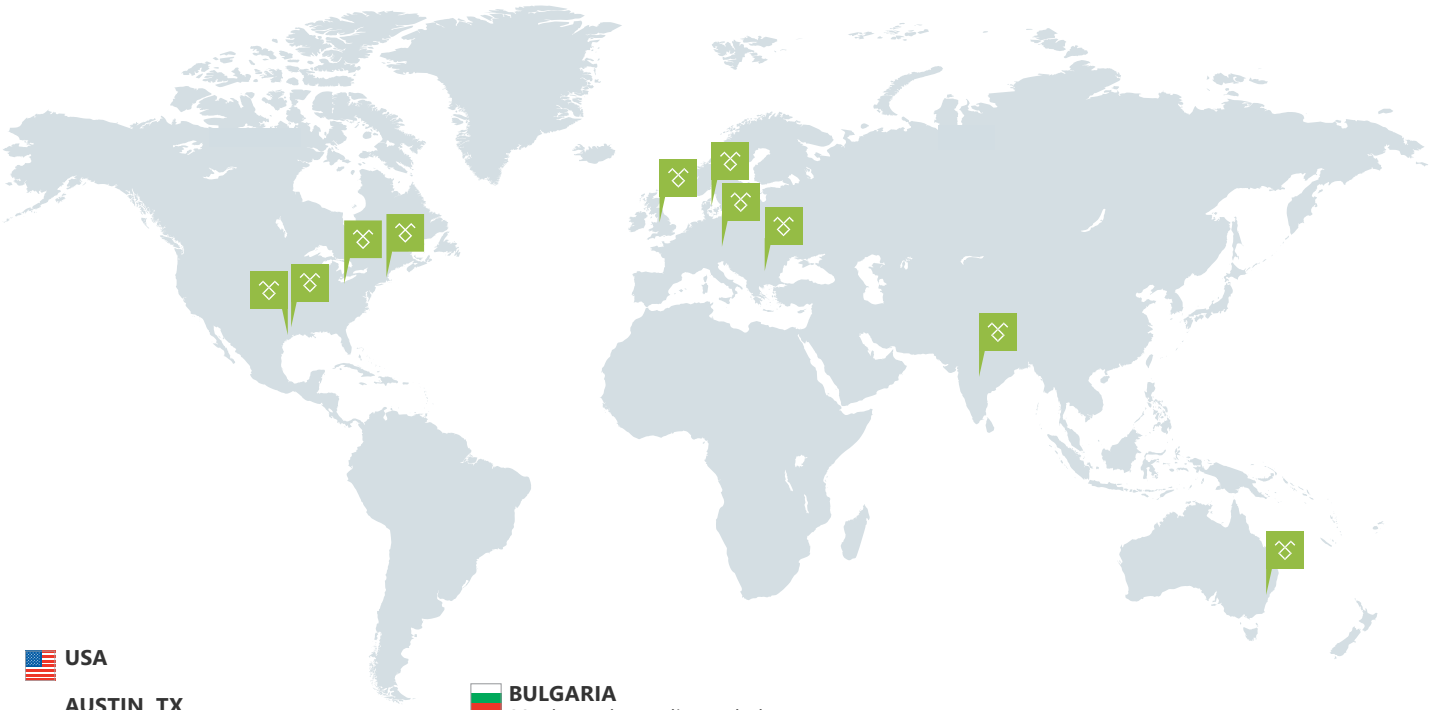

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