The Forrester Wave™: Omnichannel Functional Test Automation Tools, Q3 2018
The 15 Providers That Matter Most And How They Stack Up
by Diego Lo Giudice
July 26, 2018

Why Read This Report
In our 26-criteria evaluation of omnichannel functional test automation (OFTA) providers, we identified the 15 most significant ones — Conformiq, Eggplant, Experitest, IBM, Micro Focus Silk, Micro Focus UFT, LogiGear, Microsoft, Parasoft, Perfecto, Ranorex, Sauce Labs, SmartBear Software, Tricentis, and Worksoft — and researched, analyzed, and scored them. This report shows how each provider measures up and helps application development and delivery (AD&D) and software QA professionals make the right choice.

Key Takeaways
Eggplant, Parasoft, And Tricentis Lead The Pack
Forrester’s research uncovered a market in which Eggplant, Parasoft, and Tricentis lead the pack. IBM, SmartBear Software, Micro Focus UFT, Conformiq, Experitest, Sauce Labs, Micro Focus Silk, and Perfecto offer strong-performing options. Microsoft and Worksoft are competitive for some features, and LogiGear and Ranorex lag behind.

App Dev Pros Are Looking For Omnichannel Functional Test Automation
OFTA adoption is increasing because more AD&D and QA professionals recognize that it addresses their software quality challenges in the modern application delivery era. AD&D pros increasingly trust providers to act as strategic partners for end-to-end functional test automation, advising them on OFTA decisions.

Continuous And Smarter Test Automation And Technology Breadth Are Key Differentiators
The new context of Agile plus development and operations (DevOps) has influenced testing. Enhancing test automation across channels, extending testing to customer experience (CX), addressing multiple personas, automating design — not just execution — and shifting testing further left and right will dictate which testing vendors lead the pack.
The Forrester Wave™: Omnichannel Functional Test Automation Tools, Q3 2018

The 15 Providers That Matter Most And How They Stack Up

by Diego Lo Giudice
with Christopher Mines, Luis Deya, and Kara Hartig
July 26, 2018

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The Forrester Wave™: Continuous Testing Service Providers, Q3 2017

Now Tech: Omnichannel Functional Test Automation Tools, Q1 2018

Organize Your App-Dev Teams With Agile And DevOps

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Automated Testing Speeds Software Delivery And Digital Business

Nearly three-quarters of global services decision makers tell us they are investigating or implementing a digital transformation. Effective and fast software delivery capabilities make digital successful and Agile-plus-DevOps values, principles, and practices help AD&D pros transform application delivery in service of digital business. Application testing is right in the middle of this whirlwind. So becoming a successful digital Agile-plus-DevOps shop means that software testers must work with development teams that:

› **Design, build, and test quickly and iteratively.** Most disruptors use design thinking and Agile-plus-DevOps to ideate, build, and test offerings quickly. Testing in this environment can’t be manual. It needs to shorten testing cycles and therefore delivery cycles to support that speedy feedback loop, and OFTA tools can help do that (see Figure 1).

› **Differentiate with user experience.** Forrester’s Customer Experience Index (CX Index™) research shows that category-leading CX directly links to increased revenue and even stock valuation. Three criteria make up our definition of CX quality: effectiveness, ease, and emotion. With CX improvement becoming a goal for all digital initiatives, testing an app’s functionality requires dealing with a new dimension.

› **Have technical quality as a primary objective.** In 2018, 38% of global developers told us that their development teams measure success and status by quality — the number of defects fixed, defect density, and test coverage. Quality is by far the most important success metric that dev teams use, despite their need for speed, which is good news for the testing ecosystem.
FIGURE 1 Customers Claim Shorter Cycle Deliveries When Using OFTA Tools

“On a scale of 1 to 4, how well do you think the vendor’s tool is supporting your organization’s transition to shorter delivery cycles within an Agile-plus-DevOps context and cutting down on test cycle time?”

(Responses shown for, “My OFTA tool helps me deliver faster.”)

Base: 45 global business leaders provided by the evaluated vendors in “The Forrester Wave™: Omnichannel Functional Test Automation Tools, Q3 2018” Forrester report
Source: Forrester’s Q3 2018 Omnichannel Functional Test Automation Forrester Wave™ Customer Reference Online Survey

The Pressure Is On Testers And Increasing

Since 2013, testing practices and tools have become integral to development. Our data shows that 68% of Agile teams include testers in their product teams, 51% are dedicated full-time to one project/product, and 27% use test-driven development (TDD). Despite these improvements, short- and long-term challenges for testers lie ahead:

› Test automation is still underpenetrated. Our 2017 Agile panel survey found that 44% of functional tests are automated. Even looking at the automation of this Wave’s reference customers that use top OFTA tools in the market, only 29% reached high levels of automation (more than 70%) in the past 12 months (see Figure 2).

› Dev tester skills are hard to find. Developers are getting more directly involved in testing, especially in areas like API functional, UI functional, and nonfunctional test automation (see Figure 3). However, in our inquiries with large financial and insurance organizations implementing Agile-plus-DevOps, many complain that they can’t find enough full-stack testers or DTEST developers, even from their testing global service providers.
Customer experience testing is not for the faint of heart. Customer experience brings not only new challenges but also new opportunities to testing. Connecting user experience in production to testing strategy, functional and nonfunctional, helps teams prioritize and focus automation creation time (and keep costs under control). And testing needs analytics, machine learning, and AI to keep up with shifting user demands.

FIGURE 2 Levels Of Automation Are Distributed But Generally Low

“What level of functional test automation has your organization achieved since you have been using the vendor’s product in the past 12 months?”

Automation achieved over the past year

- 27% achieved 30% or less.
- 31% achieved between 31% and 60%.
- 42% achieved more than 60%.

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 10%</td>
<td>11%</td>
</tr>
<tr>
<td>Between 11% and 20%</td>
<td>7%</td>
</tr>
<tr>
<td>Between 21% and 30%</td>
<td>9%</td>
</tr>
<tr>
<td>Between 31% and 40%</td>
<td>2%</td>
</tr>
<tr>
<td>Between 41% and 50%</td>
<td>11%</td>
</tr>
<tr>
<td>Between 51% and 60%</td>
<td>18%</td>
</tr>
<tr>
<td>Between 61% and 70%</td>
<td>13%</td>
</tr>
<tr>
<td>Between 71% and 80%</td>
<td>7%</td>
</tr>
<tr>
<td>81% or more</td>
<td>22%</td>
</tr>
</tbody>
</table>

Base: 45 global business leaders provided by the evaluated vendors in “The Forrester Wave™: Omnichannel Functional Test Automation Tools, Q3 2018” Forrester report

Source: Forrester’s Q3 2018 Omnichannel Functional Test Automation Forrester Wave™ Customer Reference Online Survey
“How much time do you spend in a typical work day doing the following activities?”
(Responses shown for 1 hour to 4 or more hours per day)

<table>
<thead>
<tr>
<th>Activity</th>
<th>2018</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit testing code</td>
<td>53%</td>
<td>41%</td>
</tr>
<tr>
<td>Automating nonfunctional tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e.g., load, performance)</td>
<td>47%</td>
<td></td>
</tr>
<tr>
<td>Automating UI functional tests</td>
<td>48%</td>
<td>28%</td>
</tr>
<tr>
<td>Automating API functional tests</td>
<td></td>
<td>27%</td>
</tr>
</tbody>
</table>

Base: 546 (2017) and 3,228 (2018) global developers who work for a software company as a game developer, for internal IT, or in the digital or design services industry
Source: Forrester Analytics Global Business Technographics® Developer Survey, 2017 and 2018

Testing Tool Markets Are Evolving To Address New And Existing Challenges

In Forrester’s past evaluations of functional test automation and front-end mobile testing, we described the growing number of open source testing tools in the market. We also mentioned trends like the convergence of functional and performance testing and the shift toward test design automating selectively rather than comprehensively. Those criteria remain in this year’s evaluation, and new criteria capture more recent market trends of note:

› **Mobile-first but not mobile-only.** Although the market is not mobile-only, organizations think mobile-first when they design and develop innovative applications and then retrofit them for larger-screen technologies (e.g., through responsive web design). Mobile testing vendors like Experitest, Perfecto, or Xamarin (now part of Microsoft) that came to market with mobile-only testing tools or positioning are now expanding to enterprise testing across multiple channels. Despite the overall trend, mobile-only testing tools/frameworks like Robotium, Keynote, pCloudy, Espresso, and XCTest remain in the market.

› **Mainframe testing.** Mainframe was declared dead with distributed computing more than 30 years ago, and again more recently with cloud. But the truth is that mainframe is still here. In Forrester’s cloud research, mainframe is part of the pragmatic cloud. With some renewed attention to
mainframe because of back-end application modernization investments, enterprises often require continuous delivery pipelines and testing to be on mainframe too. Players like Compuware with Total Test are leading testing solutions for DevOps automation on the mainframe.

AI and ML to better test and automate. AI and machine learning (ML) bring new technologies to bear, like natural language understanding, text understanding, voice, video and image recognition, super-efficient pattern matching, and the ability to make predictions. But all require big data. Testers in services organizations like Accenture, Brillio, Cognizant, HCL Technologies, Infosys, IBM Global Services, Infostretch, TCS, Tech Mahindra, and Wipro are leveraging AI and ML to make better decisions and optimize automation. And new startups like Applitools, accelQ, Diffblue, Functionize, and Sofy.AI are making testing more autonomous.

OFTA Evaluation Overview

To assess the state of the OFTA market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of top OFTA vendors. After examining past research, user need assessments, and vendor and expert interviews, we developed a comprehensive set of evaluation criteria. We evaluated vendors against 26 criteria, which we grouped into three high-level buckets:

Current offering. We evaluated each tool’s operating environment and technology breadth, ranging from mobile to desktop, software-as-a-service (SaaS), device clouds, browsers, packaged apps, and even mainframe (the latter two to a smaller degree but still relevant for enterprise DevOps). We also evaluated front- and back-end automation and increased our focus on design, TDD, and behavior-driven development (BDD) testing; UI- and API-led execution automation with continuous integration/continuous delivery (CI/CD); and various other technology combinations. We then looked at tool qualities like reuse, maintenance, and target personas addressed; third-party integrations with nonfunctional testing tools; and real-time monitoring for connecting user experience with testing.

Strategy. We reviewed each vendor’s product road map to assess how it plans to differentiate its tools in the continuous testing market, support Agile and DevOps operating models, and prepare for the future of AI. Other evaluation criteria included pricing strategies, technology partnerships, and number of system integrator (SI) partners with relevant OFTA deployments in field.

Market presence. To determine each vendor’s market presence, we evaluated the growth of its installed base of OFTA clients and product revenue in the past 12 months as well as its geographic sales reach and distribution.
 Evaluated Vendors And Inclusion Criteria

Forrester included 15 vendors in the assessment: Conformiq, Eggplant, Experitest, IBM, Micro Focus Silk, Micro Focus UFT, LogiGear, Microsoft, Parasoft, Perfecto, Ranorex, Sauce Labs, SmartBear Software, Tricentis, and Worksoft. Each of these vendors has (see Figure 4):

 › Omnichannel testing capabilities. All of the tools enable functional automation testing across at least three of the four most popular browsers: Chrome, Firefox, Internet Explorer, and Safari. They can also execute automation on mobile phones running iOS and Android as well as mobile browsers on these.

 › Design, UI, and API omnichannel functional test automation. Vendors had to deliver at least one of three capabilities: UI automated testing, the ability to automate design, and the ability to create and execute API and web services tests. The tool also had to address at least one of the three testing personas identified: business, technical, and developer.

 › Customer references. Vendors provided contact information for at least three customers that agreed to be surveyed by Forrester about their use of the OFTA tools.

 › Presence in client inquiries and/or a tool that put it on Forrester’s radar. Forrester clients often discuss these vendors and platforms through inquiries. Alternatively, the vendor may, in Forrester’s judgment, warrant inclusion or exclusion in this evaluation because of technology trends or its market presence.
## FIGURE 4 Evaluated Vendors: Product Information And Selection Criteria

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Product evaluated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conformiq</td>
<td>Conformiq 360° Test Automation, consisting of-Creator (3.1.1) and Transformer (1.4)</td>
</tr>
<tr>
<td>Eggplant</td>
<td>Eggplant AI v2.1, Eggplant Functional 18.1, Eggplant Performance v19, Eggplant Network v3, Eggplant Automation Cloud v6, Eggplant Manager v6, Eggplant RUM (SaaS), Eggplant Monitoring (SaaS), Eggplant Performance Analyser (SaaS)</td>
</tr>
<tr>
<td>Experitest</td>
<td>SeeTest continuous testing platform for web and mobile apps v.11.7</td>
</tr>
<tr>
<td>IBM</td>
<td>Rational Test Workbench 9.2</td>
</tr>
<tr>
<td>LogiGear</td>
<td>TestArchitect 8.3 Update 4</td>
</tr>
<tr>
<td>Micro Focus</td>
<td>Silk 18.5, Unified Functional Testing 14.03</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Visual Studio Team Services (VSTS), Team Foundation Server (TFS), Visual Studio App Center (VSAC)</td>
</tr>
<tr>
<td>Parasoft</td>
<td>SOAtest 9.10.4, Test Automation Tool</td>
</tr>
<tr>
<td>Perfecto</td>
<td>Continuous Quality Lab</td>
</tr>
<tr>
<td>Ranorex</td>
<td>Ranorex Studio 8.1.1</td>
</tr>
<tr>
<td>Sauce Labs</td>
<td>Continuous Testing Cloud</td>
</tr>
<tr>
<td>SmartBear Software</td>
<td>TestComplete 12.5, ReadyAPI 2.3, CrossBrowserTesting, QAComplete, TestLeft</td>
</tr>
<tr>
<td>Tricentis</td>
<td>Tricentis Tosca 11.2, Tricentis Flood</td>
</tr>
<tr>
<td>Worksoft</td>
<td>Certify 10, Certify Execution Manager 10, Certify Business Process Procedure (BPP) 10, Certify Impact for SAP 10 and Analyze 10</td>
</tr>
</tbody>
</table>
FIGURE 4 Evaluated Vendors: Product Information And Selection Criteria (Cont.)

Vendor inclusion criteria

**Omnichannel testing capabilities.** All of the tools enable functional automation testing across at least three of the four most popular browsers: Chrome, Firefox, Internet Explorer, and Safari. They can also execute automation on mobile phones running iOS and Android as well as mobile browsers on these.

**Design, UI, and API omnichannel functional test automation.** Vendors had to deliver at least one of three capabilities: UI automated testing, the ability to automate design, and the ability to create and execute API and web services tests. The tool also had to address at least one of the three testing personas identified: business, technical, and developer.

**Customer references.** All of the participating modern application delivery functional test automation vendors provided contact information for at least three customers that agreed to be surveyed by Forrester about their use of the omnichannel functional test automation (OFTA) tools.

**Presence in client inquiries and/or a tool that put it on Forrester's radar.** Forrester clients often discuss these vendors and platforms through inquiries. Alternatively, the vendor may, in Forrester’s judgment, warrant inclusion or exclusion in this evaluation because of technology trends or its market presence.

Vendor Profiles

This evaluation of the OFTA market is intended to be a starting point only. We encourage clients to view detailed product evaluations and adapt criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool (see Figure 5 and see Figure 6). Click the link at the beginning of this report on Forrester.com to download the tool.
THE FORRESTER WAVE™
Omnichannel Functional Test Automation Tools
Q3 2018

FIGURE 5 Forrester Wave™: Omnichannel Functional Test Automation Tools, Q3 2018

The 15 Providers That Matter Most And How They Stack Up
The Forrester Wave™: Omnichannel Functional Test Automation Tools Scorecard, Q3 2018

**FIGURE 6** Forrester Wave™: Omnichannel Functional Test Automation Tools Scorecard, Q3 2018

<table>
<thead>
<tr>
<th>Current Offering</th>
<th>Forrester's Weighting</th>
<th>Conformiq</th>
<th>Eggplant</th>
<th>Experitest</th>
<th>IBM</th>
<th>LogiGear</th>
<th>Micro Focus Silk</th>
<th>Micro Focus UFT</th>
<th>Microsoft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating environments</td>
<td>50%</td>
<td>2.65</td>
<td>4.11</td>
<td>3.33</td>
<td>3.38</td>
<td>2.40</td>
<td>2.98</td>
<td>3.74</td>
<td>2.28</td>
</tr>
<tr>
<td>GUI design and automation</td>
<td>5%</td>
<td>1.00</td>
<td>4.00</td>
<td>4.00</td>
<td>3.00</td>
<td>3.00</td>
<td>4.00</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>API testing and automation</td>
<td>15%</td>
<td>1.50</td>
<td>2.50</td>
<td>4.50</td>
<td>3.50</td>
<td>3.00</td>
<td>4.00</td>
<td>4.00</td>
<td>2.50</td>
</tr>
<tr>
<td>Test and automation design</td>
<td>15%</td>
<td>3.00</td>
<td>5.00</td>
<td>5.00</td>
<td>2.00</td>
<td>2.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Packaged application testing</td>
<td>15%</td>
<td>5.00</td>
<td>4.00</td>
<td>4.00</td>
<td>2.00</td>
<td>2.00</td>
<td>3.00</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Automation execution/continuous testing</td>
<td>15%</td>
<td>3.00</td>
<td>5.00</td>
<td>5.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
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<tr>
<td>Qualities and integration</td>
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<td>4.40</td>
<td>4.00</td>
<td>3.00</td>
<td>2.00</td>
<td>4.00</td>
<td>3.60</td>
<td>3.00</td>
</tr>
<tr>
<td>Mainframe and device testing</td>
<td>15%</td>
<td>2.00</td>
<td>3.50</td>
<td>3.00</td>
<td>4.00</td>
<td>1.00</td>
<td>3.50</td>
<td>5.00</td>
<td>1.00</td>
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<td>Strategy</td>
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<td>3.00</td>
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<tr>
<td>Product road map</td>
<td>50%</td>
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<td>5.00</td>
<td>3.00</td>
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<tr>
<td>Pricing strategy</td>
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<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>1.00</td>
<td>3.00</td>
<td>3.00</td>
<td>5.00</td>
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<td>Partner strategy</td>
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<td>3.00</td>
<td>3.00</td>
<td>5.00</td>
<td>1.00</td>
<td>3.00</td>
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<tr>
<td>Market Presence</td>
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<td>0%</td>
<td>4.20</td>
<td>2.60</td>
<td>4.60</td>
<td>4.60</td>
<td>2.60</td>
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<td>2.60</td>
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<tr>
<td>Installed base</td>
<td>40%</td>
<td>5.00</td>
<td>3.00</td>
<td>5.00</td>
<td>3.00</td>
<td>1.00</td>
<td>3.00</td>
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<tr>
<td>Product growth</td>
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<td>3.00</td>
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<td>1.00</td>
<td>3.00</td>
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<tr>
<td>Sales reach</td>
<td>20%</td>
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<td>1.00</td>
<td>3.00</td>
<td>5.00</td>
<td>1.00</td>
<td>3.00</td>
<td>5.00</td>
<td>5.00</td>
</tr>
</tbody>
</table>

All scores are based on a scale of 0 (weak) to 5 (strong).
FIGURE 6 Forrester Wave™: Omnichannel Functional Test Automation Tools Scorecard, Q3 2018 (Cont.)

<table>
<thead>
<tr>
<th>Current Offering</th>
<th>Forrester’s Weighting</th>
<th>Parasoft</th>
<th>Perfecto</th>
<th>Ranorex</th>
<th>Sauce Labs</th>
<th>SmartBear Software</th>
<th>Tricentis</th>
<th>Worksoft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating environments</td>
<td>50%</td>
<td>3.30</td>
<td>2.54</td>
<td>1.65</td>
<td>2.49</td>
<td>3.29</td>
<td>3.53</td>
<td>2.28</td>
</tr>
<tr>
<td>GUI design and automation</td>
<td>5%</td>
<td>4.00</td>
<td>3.00</td>
<td>2.00</td>
<td>4.00</td>
<td>5.00</td>
<td>5.00</td>
<td>3.00</td>
</tr>
<tr>
<td>API testing and automation</td>
<td>15%</td>
<td>3.00</td>
<td>4.50</td>
<td>1.50</td>
<td>3.00</td>
<td>4.00</td>
<td>3.00</td>
<td>2.50</td>
</tr>
<tr>
<td>Test and automation design</td>
<td>15%</td>
<td>5.00</td>
<td>1.00</td>
<td>3.00</td>
<td>1.00</td>
<td>4.00</td>
<td>5.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Packaged application testing</td>
<td>15%</td>
<td>3.00</td>
<td>2.00</td>
<td>1.00</td>
<td>1.00</td>
<td>3.00</td>
<td>3.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Automation execution/continuous testing</td>
<td>15%</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Qualities and integration</td>
<td>15%</td>
<td>3.80</td>
<td>2.60</td>
<td>2.00</td>
<td>2.40</td>
<td>3.40</td>
<td>3.20</td>
<td>2.00</td>
</tr>
<tr>
<td>Mainframe and device testing</td>
<td>15%</td>
<td>2.50</td>
<td>2.50</td>
<td>1.50</td>
<td>2.50</td>
<td>2.50</td>
<td>3.00</td>
<td>3.00</td>
</tr>
</tbody>
</table>

| Strategy                                   | 50%                   | 4.00     | 3.00     | 1.50    | 3.50       | 3.50               | 3.50      | 3.00     |
| Product road map                           | 50%                   | 5.00     | 3.00     | 1.00    | 3.00       | 3.00               | 3.00      | 3.00     |
| Pricing strategy                           | 25%                   | 3.00     | 3.00     | 1.00    | 5.00       | 5.00               | 5.00      | 3.00     |
| Partner strategy                           | 25%                   | 3.00     | 3.00     | 3.00    | 3.00       | 3.00               | 3.00      | 3.00     |

| Market Presence                            | 0%                    | 3.80     | 3.40     | 3.40    | 3.40       | 2.60               | 4.60      | 2.60     |
| Installed base                             | 40%                   | 3.00     | 5.00     | 5.00    | 3.00       | 3.00               | 5.00      | 3.00     |
| Product growth                             | 40%                   | 5.00     | 3.00     | 3.00    | 5.00       | 3.00               | 5.00      | 3.00     |
| Sales reach                                | 20%                   | 3.00     | 1.00     | 1.00    | 1.00       | 1.00               | 3.00      | 1.00     |

All scores are based on a scale of 0 (weak) to 5 (strong).
Leaders

› **Eggplant leverages AI and automation to test UX and business outcomes.** In the past 18 months, Eggplant evolved and improved in three important aspects: It developed a scriptless AI model-based language, extended functional testing to include early steps of customer experience testing, and addressed its API testing weakness. Eggplant is connecting its recently acquired performance management and user experience (UX) monitoring technology to functional testing, giving testers the opportunity to model business outcomes with Eggplant AI and validate them before releasing the apps into production. Customers using Eggplant are very positive about the extended testing persona options offered, the collaboration possible among them, the level of reuse the tool provides, and the levels of automation they achieve (60% to 70%).

While the AI technology and algorithms acquired and developed internally are part of its road map, Eggplant has yet to determine how to price these features simply, which is a concern we heard from customers. Eggplant also has relatively weak global sales reach and needs to improve its SI partner strategy to expand its customer footprint.

› **Parasoft strengthens its developer focus and makes API testing easier.** Parasoft has traditionally been a go-to testing platform for developers. In the past 12 to 18 months, it has added features to appeal to less technical folks too. Its recent addition of a specific UI enables testers with no coding experience to easily generate and manage API tests — all facilitated by underlying ML. Regarding AI, Parasoft has an impressive and concrete road map to increase test automation from design to execution, pushing autonomous testing. Parasoft shined in our evaluation specifically around effective test maintenance, strong CI/CD and application lifecycle management (ALM) platform integration, as well as reporting through its analytics system PIE. Clients like the recent changes, and all reference customers reported achieving test automation of more than 50% in the past 12 months.

The recent tool updates are important because customers complain that the tool is relatively hard to master. Customers often need Parasoft specialists’ support to leverage its full potential. Pricing would benefit from flexibility for gradual enterprise adoption. Parasoft also has some work to do in addressing front-end mobile testing, which it only offers through partners adding little value-add.

› **Tricentis extends its end-to-end testing capabilities and gives a nod to developers.** Tricentis has a multipronged approach to continuous testing, addressing both the packaged and the custom development worlds. Its tool, Tosca, offers a strong scriptless environment, which is well designed with nicely engineered wizards that help design and automate tests quickly and effectively in a technology-independent way. Tricentis also created an easy-to-use UI for nontechnical folks to test APIs and strengthened its integration with Jira to support CI/CD. Although not part of this evaluation, the very recent acquisitions of QASymphony for test management automation and the test data management company Q-Up will make Tosca a more complete end-to-end testing platform. Its mobile testing strategy extends through cloud device farm partners for
distributed mobile testing on multiple types of devices and OSes. Clients appreciate the improved transparency and simplicity of Tosca pricing. Tosca also experienced strong market growth — thanks to its acquisitions especially.

Tricentis needs to strengthen the mobile device side of its omnichannel offer and make sure its clients get more added value directly from Tosca rather than just a loose third-party integration. Despite its strong scriptless approach, Tosca does not yet offer a competitive TDD or BDD solution. Improvements are on the road map. As testing shifts right, and not just left, Tosca lacks in integration and user monitoring tools in testing. Although it’s a conscious decision, Tosca does not support full-stack developers who want tight integration with their integrated development environment (IDE) and full code scripting.

**Strong Performers**

› **IBM keeps its focus on the heterogeneous enterprise for DevOps at scale.** For broad, complex enterprise-at-scale testing, IBM is front and center. Its mobile strategy focuses on assuring mobile cloud labs’ independence, offering freedom of choice to its customers in addition to its partnership with Perfecto. By including mainframe in its DevOps and cloud strategies, IBM’s test automation incorporates both terminal emulation and back-end API testing. API testing and test assets reuse shined in this year’s evaluation. Product evolution for IBM revolves around four main themes: integration, ease of use, openness, and enterprise-grade testing. Long-term clients highlighted great and consistent customer support.

Mobile independence unfortunately comes with weak front-end mobile testing (e.g., testing features based on sensors). IBM’s road map focuses mostly on tactical improvements: extending technologies and protocols and expanding on SAP — with some exciting innovation but very long-term. The average automation level across referenced clients was less than 50%.

› **SmartBear Software extends its testing personas beyond developers.** SmartBear Software continues to expand its breadth of testing personas beyond technical and developer testers and has had great success with its SoapUI open source offering. SmartBear Software offers superior capabilities in API testing and coding-based scripting. It also provides a strong TDD and BDD offering, enabling developers to maintain their existing CI environment while converting Cucumber feature files into functional test code. It will further strengthen BDD through the recent acquisition of the French startup Hiptest, which will enable business testers to leverage the more technical automation capabilities of SmartBear Software’s OFTA solutions. SmartBear Software offers an option to run its testing tools as a SaaS offering with a subscription-based model and its own proprietary mobile device cloud. Clients liked the flexibility of SmartBear Software’s tool expandability.
SmartBear Software needs to keep working on its scriptless road map and persona expansion strategy for business users. Automated test design lacked in helping customers achieve complete automation and business-driven testing. To meet incumbent enterprise clients’ needs with heterogeneous DevOps pipelines, SmartBear Software needs to pay more attention to mainframe and packaged apps.

› **Micro Focus UFT offers omnichannel testing on mainframe, desktop, web, and mobile.** UFT and LeanFT tools target professional testers, centers of excellence practitioners, and developer personas. Micro Focus UFT offers tools as SaaS, which all types of testing personas from business to techie can use. It also increased its focus on developers with LeanFT, a strong play in CI/CD, and both Selenium and Appium support. UFT and LeanFT show strong functional and performance testing convergence, allowing reuse of functional tests and scripts for early performance smoke testing. And UFT and LeanFT provide superior capabilities for testing mainframe apps as well as mobile device testing on Micro Focus’ captive cloud. A notable feature of its road map is the addition of synthetic test data management.

For teams seeking high levels of automation, focusing only on automation execution won’t suffice, and today that’s all they get with UFT/LeanFT. Like many of the big vendors, the Micro Focus UFT offering suffers from modest product growth. Clients that are aggressively pursuing Agile-plus-DevOps have migrated away from Hewlett Packard Enterprises’ (HPE’s) test solutions (especially QC) due to a slow innovation cycle that culminated in Octane. Unfortunately, we have not seen much acceleration on the innovation front since the recent acquisition of HPE’s software assets by Micro Focus.

› **Conformiq makes its test design automation smarter and stronger with AI.** Conformiq Intelligent Test Automation (CITA) reads and automates manual tests using natural language processing and optimizes the use of test data. Conformiq is one of the strongest tools addressing the design automation market. It enables users to continuously automate test design, not just execution. It not only has superior test design automation but also offers varied ways of combining different types of automation (e.g., API, scriptless, coding). A reference customer nicely summarized the power of Conformiq design automation by saying, “This tool helps automate the test design cases, which ultimately saves time as it generates the right test cases that will be executed and automated.”

Some clients complained that model-driven testing wasn’t easy and they often needed help from experts. But they also said that getting support from the SIs that OEMs or Conformiq used in their testing services was not always effective, and they would have preferred Conformiq’s expert intervention. Although Conformiq has many strong SI partnerships, it depends on them, so clients don’t have a direct relationship with Conformiq. The same applies to its decision to focus on design automation and integrate third-party tools for test automation execution, providing a half-baked differentiating experience.
› **Experitest has strong UI and scripting capabilities for web and mobile.** Experitest is well known for its mobile testing platform. But it also offers a complete testing environment for both web and mobile, a robust mobile device cloud, and extensive cross-browser testing. Record and replay for both web and mobile are solid and give developers a strong code scripting option. Experitest’s integrations for maintaining and reusing tests and leveraging real-time app monitoring are also excellent. It is one of the few players to offer a unified platform for both mobile and web on its cloud and is introducing a differentiated visual testing tool for cross-browser and mobile testing that manages visual layouts (besides functional test) in an automated and precise way. Experitest shows strong market growth, and all reference clients claimed reaching more than 60% automation through Experitest in the past 12 months.

Its previous emphasis on mobile still characterizes Experitest in the market, even though it has addressed both web and mobile for some time now. However, web and mobile are only the first steps in addressing the broader omnichannel market where heterogeneous needs of true DevOps applications with a mix of client/server, packaged apps, and mainframe are part of software pipelines. API testing is also a weak point, especially for developer personas.

› **Sauce Labs is developers’ choice for cross-browser and mobile test in the cloud.** Sauce Labs enjoys broad developer adoption because developers work directly in the IDE and their programming language of choice. It especially suits teams using Selenium and/or Appium because the creators and founders of such keep in contact with the company’s engineering team. It has excellent CI/CD integration, strong product revenue growth, and a transparent and simplified pricing strategy. Its road map includes ML-based smart analytics, which makes a lot of sense given the extensive set of data it can leverage on its cloud. Clients appreciate fast upgrades for the latest browsers and OSes. On average, reference customers report reaching functional test automation of more than 80% in the past 12 months, showing that automation gets higher when implemented by developers and treated as code.

Having a separate platform for device and web testing increases overhead and costs. But Sauce Labs is working on unifying the two. Although Sauce Labs’ sales reach is narrow and mostly US-based, it established a presence in Europe through the acquisition of TestObject. It only offers API testing through third-party partnerships and test creation environments through integration partnerships (often led by partners) or open source frameworks. This gap, along with a lack of design automation or optimization, limits its market reach, but this is a deliberate strategic choice at the moment.

› **Micro Focus Silk offers multipersona testing for less technical users.** Micro Focus Silk not only focuses on developer testers with its Silk4J framework and a strong code scripting environment but also appeals to less technical testers. Silk offers strong functional and performance testing convergence as well as integration with open source Selenium/WebDriver, APIs, and service virtualization. It integrates its mobile device cloud into overall test automation, and clients enjoy excellent technical support. To further expand on its business personas, Micro Focus has a codeless and natural language processing tool in its product road map.
The vendor’s focus is on execution automation rather than design automation, and its integration strategy for Silk and UFT/LeanFT is still quite unclear. For Silk, just as for UFT/LeanFT, Micro Focus needs to energize product growth. Clients using Silk reported reaching test automation of less than 50% in the past 12 months.

› **Perfecto offers large-scale performance and optimized automation in the cloud.** Perfecto is a popular cloud device farm choice, even for other vendors in this Wave. Its cloud farm offers high-level performance test execution at scale. Perfecto targets technical and developer testers with a very good UI-led automation experience and code scripting environment across both mobile and web (e.g., Selenium and Appium) in continuous delivery pipelines. Most of its implementation and transformation efforts focus on optimizing execution automation to increase scale with concurrence and parallelism and prioritizing what to execute next. Perfecto has strong new reporting and analytics features with Digital Zoom, record and replay capabilities, developer tester targeting, and mobile device testing.

Perfecto’s robust cloud device farm was one of the first in the market, but Perfecto lacks support for simulated and emulated device testing, which is particularly crucial for testing mobile apps in CI/CD pipelines. It focuses on execution automation rather than design automation, even in its roadmap. Although it mostly targets technical testers and developers, it lacks its own value-add for API testing capabilities. We received limited reference client feedback. Opinions about web and mobile support were mixed, but clients claimed a high degree of automation.

**Contenders**

› **Microsoft brings automation to the cloud and bets its future on developers.** Microsoft’s view is that developers will eventually own the entire life-cycle process from design to implementation, test, and deployment including operations monitoring and management. So its strategy for testing tools aligns with that vision — focusing, for example, on dev testers. Its current solution (packaged in VSTS, TFS, and VSAC) includes testing components like Coded UI, which addresses client/server and cross-browser testing, and its acquired Xamarin mobile testing platform. Strong scaling and integration with DevOps on Azure and test maintenance capabilities for cloud testing are primary strengths of the Microsoft offering.

Mobile app testing has cloud-based physical device labs, with no emulated or simulated device testing and minimal device sensor testing capabilities. Despite Microsoft’s open source commitments and its recent acquisition of GitHub, its testing tools offer only limited support for Selenium and Appium. Reference customers noted that Microsoft does not fully address all the platforms and build/release processes they need, especially for CI integration, and that pricing does not align with business needs (concurrence versus device hours). Customers using Microsoft testing tools reported reaching test automation of less than 50% in the past 12 months.
Worksoft aims to be the go-to for DevOps packaged application testing. Worksoft is one of the few superior choices in the market for exclusively addressing packaged application (particularly SAP) testing. This is both the current focus and the future direction of the company. Even so, Worksoft’s omnichannel testing addresses the typical heterogeneous needs of automating tests for business applications across client desktops, web, and mainframe. For mobile testing, teams must couple Worksoft with third-party mobile cloud device solutions. Worksoft’s strategy targets prospects that are adopting a continuous delivery and DevOps approach in concert with packaged apps. Worksoft has excellent integration with more than 150 different types and releases of packaged application platforms. Reference clients are happy with Worksoft’s browser testing capabilities and its support and partnership.

Worksoft does not add any particular front-end mobile device testing value-add to the third-party cloud device options with which Worksoft integrates. Clients’ automation reached 40% to 80% in the past 12 months. For clients that want continuous testing for enterprise business applications on SAP, Oracle, Salesforce, or other packaged apps, Worksoft is a good choice.

Challengers

LogiGear provides powerful test automation through an Excel-style interface. For many manual testers, living in Excel is a comfortable experience. In fact, LogiGear gives these manual testers a familiar Excel-driven test creation editor and automation scripting environment. In LogiGear, the clean separation between the functional test case data and information-versus-technology configuration setup helps reuse across different test scenarios and projects. LogiGear also offers a strong BDD/TDD solution to make test automation easier. The vendor’s road map focuses on increasing its presence and focus in the packaged application testing market and expanding personas to business testers. Reference customers cited the tool’s strong alignment with technical testers, appreciate the company’s professional services support, and like its broad browser and horizontal technology support, including open source.

Despite its technology coverage, reference clients reported a broad range of automation, from very low to very high, proving that automation also depends on how the tool is used. Clients cited a lack of explicit road map discussion for the product. Our evaluation revealed gaps in various areas: mobile testing, personas (only technical), and integration features (only for test reuse). LogiGear showed relatively slow product growth, which is worrying because it is a small company.

Ranorex offers flexible automation in a combined web and mobile platform. Ranorex offers exceptional combined automation for various technologies, and other vendors have partnered with Ranorex to fill their own gaps. Ranorex offers decent record and replay, test maintenance, and test reuse capabilities. The vendor’s recent acquisition by Idera and resulting road map promise to bring investments and improvements in areas such as technology coverage, integrations with ALM and test management tools including the sister tool TestRail from Idera, and extension of target personas for less technical users. Ranorex has a large installed base, which will help prioritize requirements for growth of its product capabilities.
Clients needing a broader spectrum of testing personas will find limitations in Ranorex, which does not address developer testers or business persona testers. It also needs to work on its design automation capabilities, TDD/BDD, packaged application testing, integration with CI/CD, comprehensiveness of API testing types and protocols, dynamic reporting and analytics, and mobile testing value-adds to third-party integration offers. We did not receive enough responses from customers to share any feedback.

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### Supplemental Material

**Online Resource**

The online version of Figure 5 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings. Click the link at the beginning of this report on Forrester.com to download the tool.
Data Sources Used In This Forrester Wave

Forrester used a combination of four data sources to assess the strengths and weaknesses of each solution. We evaluated the vendors participating in this Forrester Wave, in part, using materials that they provided to us by July 6, 2018.

› Hands-on lab evaluations. Vendors spent one day with a team of analysts who performed a hands-on evaluation of the product using a scenario-based testing methodology. We evaluated each product using the same scenario(s), creating a level playing field by evaluating every product on the same criteria.

› Vendor surveys. Forrester surveyed vendors on their capabilities as they relate to the evaluation criteria. Once we analyzed the completed vendor surveys, we conducted vendor calls where necessary to gather details of vendor qualifications.

› Product demos. We asked vendors to conduct demonstrations of their products’ functionality. We used findings from these product demos to validate details of each vendor’s product capabilities.

› Customer reference calls. To validate product and vendor qualifications, Forrester also conducted reference surveys with three of each vendor’s current customers.

The Forrester Wave Methodology

We conduct primary research to develop a list of vendors that meet our criteria for evaluation in this market. From that initial pool of vendors, we narrow our final list. We choose these vendors based on 1) product fit; 2) customer success; and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don’t fit the scope of our evaluation. Vendors marked as incomplete participants met our defined inclusion criteria but declined to participate or contributed only partially to the evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria, we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave evaluation — and then score the vendors based on a clearly defined scale. We intend these default weightings to serve only as a starting point and encourage readers to adapt the weightings to fit their individual needs through the Excel-based tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve. Vendors marked as incomplete participants met our defined inclusion criteria but declined to participate in or contributed only partially to the evaluation. For more information on the methodology that every Forrester Wave follows, please visit The Forrester Wave™ Methodology Guide on our website.
Integrity Policy

We conduct all our research, including Forrester Wave evaluations, in accordance with the Integrity Policy posted on our website.

Survey Methodology

Forrester’s Q3 2018 Omnichannel Functional Test Automation Forrester Wave™ Customer Reference Online Survey was fielded between May 16 and May 28, 2018. This online survey included 45 global technology leaders who were current clients of the vendors included in “The Forrester Wave™: Omnichannel Functional Test Automation Tools, Q3 2018.” We asked each vendor to supply at least three customers. For quality assurance, we required all respondents to provide contact information and answer basic questions about their firms’ revenues and budgets and their level of satisfaction with their OFTA solution.

Exact sample sizes are provided in this report on a question-by-question basis. Panels are not guaranteed to be representative of the population. Unless otherwise noted, statistical data is intended to be used for descriptive and not inferential purposes.

The Forrester Analytics Global Business Technographics® Developer Survey, 2018, was fielded in March and April 2018. This online survey included 3,228 respondents in Australia, Canada, China, France, Germany, India, the UK, and the US.

The Forrester Analytics Global Business Technographics Developers Survey, 2017, was fielded in February 2017. This online survey included 2,062 respondents in Australia, Brazil, Canada, China, France, Germany, India, New Zealand, the UK, and the US.

Forrester Analytics’ Business Technographics ensures that the final survey population contains only those with significant involvement in the planning, funding, and purchasing of business and technology products and services. Research Now fielded these surveys on behalf of Forrester. Survey respondent incentives include points redeemable for gift certificates. Please note that the brand questions included in these surveys should not be used to measure market share. The purpose of Forrester Analytics’ Business Technographics brand questions is to show usage of a brand by a specific target audience at one point in time.

Endnotes

1 Some 72% of global services decision makers claimed to be investing in or undergoing digital transformation. Source: Forrester Analytics Global Business Technographics Business And Technology Services Survey, 2017.


3 For an example, see the Forrester report “The US Customer Experience Index, 2018.”
4 For more on effectiveness — the experience delivers value to customers; ease — it’s not difficult to get value from the experience; emotion — customers feel good about their experience, see the Forrester report “Answers To Common Questions About Forrester’s Customer Experience Index.”


6 Source: Forrester’s Q3 2017 Global Agile Software Application Development Online Survey. For more information, see the Forrester report “The State Of Agile 2017: Agile At Scale.”

7 Source: Forrester’s Q3 2017 Global Agile Software Application Development Online Survey. For more information, see the Forrester report “The State Of Agile 2017: Agile At Scale.”

8 See the Forrester report “How AI Will Change Software Development And Applications.”

9 See the Forrester report “The Forrester Wave™: Modern Application Functional Test Automation Tools, Q4 2016” and see the Forrester report “The Forrester Wave™: Mobile Front-End Test Automation Tools, Q2 2016.”

10 See the Forrester report “Adoption Profile: Public Cloud In Europe, Q2 2018.”
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