

# TESTING TRENDS IN 2016: A SURVEY OF SOFTWARE PROFESSIONALS

Today's online environments have created a dramatic new set of challenges for software professionals responsible for the quality of web applications. Time to market needs create increasing pressure on release cycles. Methodologies aiming to reduce development times have been broadly adopted, but are release cycles where they need to be? How is application quality impacted? What has been the impact of constantly evolving technology like new browsers and cloud computing?

The following report, sponsored by Sauce Labs, is based on a survey of 520 software professionals responsible for the quality of web applications. The goal of this global survey was to understand current trends in testing online environments. Certain questions were repeated from a similar survey conducted to the same audience one year ago to allow for trend analysis.



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#### **EXECUTIVE SUMMARY**

- Agile is ubiquitous but few have fully embraced testing best practices
  - 67% are deploying at least weekly
  - 46% want to deploy faster
  - Only 21% have achieved all 5 key areas of agile testing maturity including:
    - > 23% fix bugs right away
    - > 24% iterate small testable requirements rather than waiting for features to be completed
    - > 26% have more automated testing than manual
    - > 77% of the development and QA teams communicate in real-time
    - > 86% report development and QA teams think of themselves as partners
- Continuous Integration (CI) changes testing
  - Adoption of CI results in more automated testing and testing earlier in the development cycle for the majority of those who adopt it
  - CI also results in more systematic and rigorous testing, trying more things for customer feedback, and writing code with fewer errors – but it frequently takes more time to achieve these results
- Cross browser testing remains important, especially for large organizations
  - 95% of large companies perform cross browser testing compared to 86% of small companies
  - 68% of large companies test on older browser versions vs. only 60% of small companies
  - 32% test their applications on Microsoft Edge
  - Need for Internet Explorer testing has not decreased in past year
- Use of cloud-based testing platforms holds steady
  - The number of companies testing in the cloud increased only slightly in past year from 43% to 45%

#### **DETAILED FINDINGS: AGILE**

#### Already ubiquitous, adoption of agile continues to expand

Agile development has become the norm in web application environments, and continues to grow. In the survey conducted one year ago, agile development was already ubiquitous with 82% of organizations reporting they had adopted the methodology. This number grew in the past year to 88%.





#### Software organizations still want to deploy even faster

The broad adoption of agile has not solved the pressures for constantly faster releases. We asked survey participants the typical rate at which they deploy applications today. More than 2 in 3 organizations do deploy at least weekly (67%), which is a tremendous achievement. However, this speed is still not adequate for many software teams. When asked how quickly they would ideally like to release, the response was often different.



When each individual answer given for the speed of a typical build was compared to that same participant's answer for how often they would like to deploy, almost half indicated they want a faster deployment time than they currently have (46%). For example those that currently deploy on a daily basis but want to deploy hourly, and teams that report they deploy biweekly



but want to deploy weekly or daily. Not surprisingly, there was not a single individual in this study who indicated that their ideal deployment schedule would be slower than their current one (0%).



# Fully agile or just "fast waterfall"?

In an attempt to understand why deployment was slower than desired for so many organizations even though they had embraced agile, we asked questions to drill down on how extensively agile QA best practices had been adopted. While there are many approaches taken to agile development, as a general rule there are certain key best practices for testing in a fully agile process. We asked questions of the participants who indicated they had embraced agile to quantify their maturity in these areas:

- 1. Development and QA work as partners to deliver applications
- 2. Development and QA teams communicate in real-time
- 3. Bugs are fixed immediately
- 4. Testing is highly automated
- 5. Development and testing is highly iterative

A key foundation of agile is that development and QA teams work in tight partnership. This part of agile is definitely working. The vast majority of software teams doing agile (86%) report that these teams consider themselves to be partners in delivering high quality applications. Human nature being what it is, it would not be surprising if there were an antagonistic relationship between teams whose job is to critique each others' work, but this very real and potentially harmful scenario was only reported by a small number of software teams (4%).





Equally important to attitude is the timeliness of communication between QA and development teams. The traditional model of a QA team sitting independently capturing bugs in a tracking system or writing long and detailed email threads does not facilitate the speed of an agile development. This change has been made by agile organizations with most (77%) describing day-to-day communications between QA and development happening in real time, either in person or via messaging. Only a few (23%) still use systems that are not real time.



However, not all testing best practices for agile have been achieved. One of the important concepts within agile is that bugs are not left to sit around. As soon as they are identified they should be fixed. Unfortunately, only a small number of organizations that have adopted agile have achieved this important level of maturity (23%). There is some good news. Most agile teams are doing better than a traditional waterfall approach, with only 5% reporting that it takes more than a few days for most bugs to be fixed, but almost half still take many days to fix bugs (48%). It is also still common (24%) to go through the process of putting bugs into a tracking system for later prioritization and fixing, which adds time.





Another area of weakness among agile development teams is their adoption of test automation. A key approach for speeding release cycles is to embrace automation to quickly test changes to rapidly evolving code in order to catch problems immediately and not delay deployment. However, only 1 in 4 (26%) have broadly adopted test automation. A worrisome 41% are still testing either completely or primarily with manual methods. This is not an area that is being ignored – about a third (34%) have automated about half of their testing effort – but more work is needed to fully achieve the promise of agile.



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Arguably the most important best practice for testing in agile is that code is tested as soon as it is written. The goal for a fully agile team is to achieve a micro-iterative process, where features are broken down into small testable requirements to speed the identification and fixing of bugs while the code is still fresh in the developer's mind. Unfortunately only a minority (24%) of agile software organizations have achieved this micro-iterative approach. Most have made some progress, with only 17% saying that complete features are passed for testing when done. But for most agile teams (59%) it is still the norm for individual features to be completed before being passed to the QA team.

![](_page_7_Figure_1.jpeg)

If we examine all of these five agile testing best practices together, it becomes clear that there is significant room to improve. Only 1 in 5 agile development teams (21%) have achieved all of these 5 areas within agile. For most (79%), they are doing better than before but still have work to do.

![](_page_7_Figure_3.jpeg)

![](_page_7_Picture_4.jpeg)

It is important to note that there are no real differences in terms of company size when looking at how successfully these best practices have been adopted. We identified fully agile teams in very small as well as very large companies. Any software team with the right processes and focus has the potential to achieve the full benefits of agile, regardless of size.

# **DETAILED FINDINGS: CONTINUOUS INTEGRATION**

### Adoption of Continuous Integration (CI) grows

Continuous Integration (CI) also saw growth in the past year, from 70% in the beginning of 2015 to 77% in this most recent survey.

![](_page_8_Figure_4.jpeg)

Use of CI servers also evolved, with Jenkins taking an even more pronounced lead with 68% of those using a Continuous Integration server indicating use, up from 55% in 2015. Use of Microsoft Visual Studio / TFS was asked for the first time this year and saw a strong response rate with 12% reporting use.

![](_page_8_Picture_6.jpeg)

![](_page_9_Figure_0.jpeg)

# Early, automated testing comes first but other benefits follow

Testing efforts and outcomes change with the adoption of Continuous Integration. Interestingly we saw in both the 2015 and 2016 surveys that about the same number of participants indicated that they do more automated testing and that they test earlier in the development cycle. However, the 2016 survey saw more companies seeing other benefits than in the previous year. One third (33%) reported that their testing was more rigorous with CI, up from only a quarter (26%) in last year's survey. Similar differences were seen with trying more features for customer feedback (22% in 2015 increased to 32% in 2016) and writing code with fewer errors (17% in 2015 increased to 21% in 2016). This indicates that the first changes come very quickly with the adoption of CI, but certain changes may take more time after the initial adoption.

![](_page_9_Picture_3.jpeg)

![](_page_10_Figure_0.jpeg)

# DETAILED FINDINGS: CROSS BROWSER TESTING

#### Need for Cross Browser Testing Remains Constant

Cross browser testing has been important since the days of Internet Explorer and Netscape. This has not seen any measureable change in the past year. The vast majority (91%) continue to say that they do cross browser testing and that it is important.

![](_page_10_Figure_4.jpeg)

Cross browser testing is particularly important with larger organizations. In the biggest companies 95% do cross browser testing compared to 86% in the small companies.

![](_page_10_Picture_6.jpeg)

![](_page_11_Figure_0.jpeg)

One change that we did see this year is an increase in testing applications on older versions of browsers. While this was a requirement for most in 2015 (57%) the focus on additional browser testing has increased during the past year (63% in 2016).

![](_page_11_Figure_2.jpeg)

Again, there is a difference in the need to test older browser versions among different company sizes. Large companies are more likely to test prior browser versions (68%) than small companies (60%).

![](_page_11_Picture_4.jpeg)

![](_page_12_Figure_0.jpeg)

# **Testing for Microsoft Browsers Increases**

One of the biggest changes in the browser landscape in 2015 was the release of Microsoft Edge. Already about a third of software teams are testing on Edge (32%). This has not resulted in a decrease of testing on Internet Explorer, which actually increased in test focus for 2016 (94% compared to 91% in the prior year). Opera did see a significant drop in focus, with only 10% reporting that they test in this browser in 2016 compared to almost twice that number (19%) in 2015.

![](_page_12_Figure_3.jpeg)

![](_page_12_Picture_4.jpeg)

# DETAILED FINDINGS: CLOUD

#### Use of Cloud for Testing Remains Steady

The use of private and public clouds for functional and unit testing stayed fairly constant in the past year. There was a very slight increase in overall use of cloud with 43% reporting use of cloud (private, public, or both) in 2015 compared to 45% in the most recent survey.

![](_page_13_Figure_3.jpeg)

# SURVEY METHODOLOGY AND PARTICIPANT DEMOGRAPHICS

A global database of software professionals responsible for the quality of web applications was emailed an invitation to participate in a Web survey on the topic of testing trends. A total of 520 individuals completed the survey. Participants included a variety of roles, company sizes, industries and regions. A copy of this report was offered as an incentive for participation. Certain questions were repeated from a similar survey conducted with the same audience one year ago to capture changes.

![](_page_13_Figure_6.jpeg)

![](_page_13_Picture_7.jpeg)

#### **ABOUT DIMENSIONAL RESEARCH**

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![](_page_14_Picture_2.jpeg)

![](_page_15_Picture_0.jpeg)

# ABOUT SAUCE LABS

Sauce Labs ensures the world's leading apps and websites work flawlessly on every browser, OS and device. Its award-winning Continuous Testing Cloud provides development and quality teams with instant access to the test coverage, scalability, and analytics they need to deliver a flawless digital experience. Sauce Labs is a privately held company funded by Toba Capital, Salesforce Ventures, Centerview Capital Technology, IVP and Adams Street Partners. For more information, please visit saucelabs.com.

![](_page_15_Picture_3.jpeg)

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