

The background of the page features abstract geometric shapes. At the top, there is a large blue triangle pointing downwards. In the center, there is a red triangle pointing upwards. To the right of the red triangle, a dark blue line extends diagonally downwards. The overall design is clean and modern, using a white background with these three primary colors.

# ISTQB®

# WORLDWIDE

# SOFTWARE TESTING

# PRACTICES REPORT

## 2017-18



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# MESSAGE

## FROM THE PRESIDENT



GUALTIERO BAZZANA,  
ISTQB® PRESIDENT

ISTQB® (International Software Testing Qualifications Board - [www.istqb.org](http://www.istqb.org)) has created the world's most successful scheme for certifying software testers. As of December 2017, ISTQB® has administered well over 785,000 exams and issued more than 570,000 certifications in over 120 countries world-wide, with a growth rate of about 65,000 certifications per year.

As a nonprofit-organization with its mission of "advancing the software testing profession", ISTQB® regularly conducts survey to assess the trends in testing industry world-wide. Such report are publicly available on the ISTQB® Web Site. In 2015 we conducted the first survey looking at the "Worldwide Software Testing Practices", that is now followed by the second edition, that is published in this report.



The report covers several topics, ranging from organizational and budgetary aspects, to techniques/ processes/ tools, through skills and competencies; we think it provides useful information for all the professionals involved in the testing market, as well as direction for the further evolution of the ISTQB® scheme. This is an exciting time in the testing industry and the report data will significantly help the evolutions that ISTQB® is currently undertaking to ensure we develop and maintain syllabi that continue to reflect changing testing practices and that meet market demands.

The report was designed by the ISTQB® Marketing Working Group and endorsed by ISTQB® Member Boards, accredited training providers and exam providers, collecting more than 2000 responses from 92 countries.

I would like to thank all of you who responded to the survey; your valuable feedback will contribute to the improvement of the ISTQB® scheme.

## MAIN FINDINGS

1

More than 2.000 people from 92 countries contributed to the ISTQB® Worldwide Software Testing Practices Report 2017-2018. In this year's report, respondents' geographic distribution is quite well balanced.

2

The outcome of the 2017 - 18 report is mostly in parallel with the results of the one done in 2015 - 16.

3

Test analyst, test manager and technical test analyst titles are the top three titles used in a typical tester's career path.

4

Main improvement areas in software testing are test automation, knowledge about test processes, and communication between development and testing.

**5**

**Top five test design techniques utilized by software testing teams are use case testing, exploratory testing, boundary value analysis, checklist based, and error guessing.**

**6**

**New technologies or subjects that are expected to affect software testing in near future are security, artificial intelligence, and big data.**

**7**

**Trending topics for software testing profession in near future will be test automation, agile testing, and security testing.**

**8**

**Non-testing skills expected from a typical tester are soft skills, business/domain knowledge, and business analysis skills.**

# EXECUTIVE

# SUMMARY

Since the first release of ISTQB® World Software Testing Practices Report in 2015, many software development and technology trends have emerged or increased their prevalence. Agile frameworks, DevOps, continuous integration, continuous delivery, continuous testing, artificial intelligence, big data etc., continue to have an impact on how organizations develop software. Our latest report suggests that the challenges associated with these “hot topics” are recognized and driving developments in testing approaches and skills needs.

In the latest report, respondents indicate that:

- **Testing responsibility:** In-house test team, developers, end-users
- **Improving the competency level of testers:** Training on the job, certification of competencies, formal training
- **SDLC model used:** Agile, sequential, iterative
- **Defect finding before test execution:** review of requirements, review of designs, source code inspection
- **Career path for a tester:** Test analyst, test manager, technical test analyst
- **Career path for a test manager:** Test department director, project manager, development manager
- **Tools used:** Defect tracking, test automation, test execution
- **Main objectives of testing activities:** To detect bugs, to show the system is working properly, to gain confidence
- **Main improvement areas in software testing:** Test automation, knowledge about test processes, communication between development and testing
- **Test techniques utilized (top five):** Use case testing, exploratory testing, boundary value analysis, checklist based, error guessing
- **Test levels most budget allocated:** System, integration, user acceptance, unit/component

The results above are similar to those in the 2015-2016 report; differences highlighted in the latest report include:

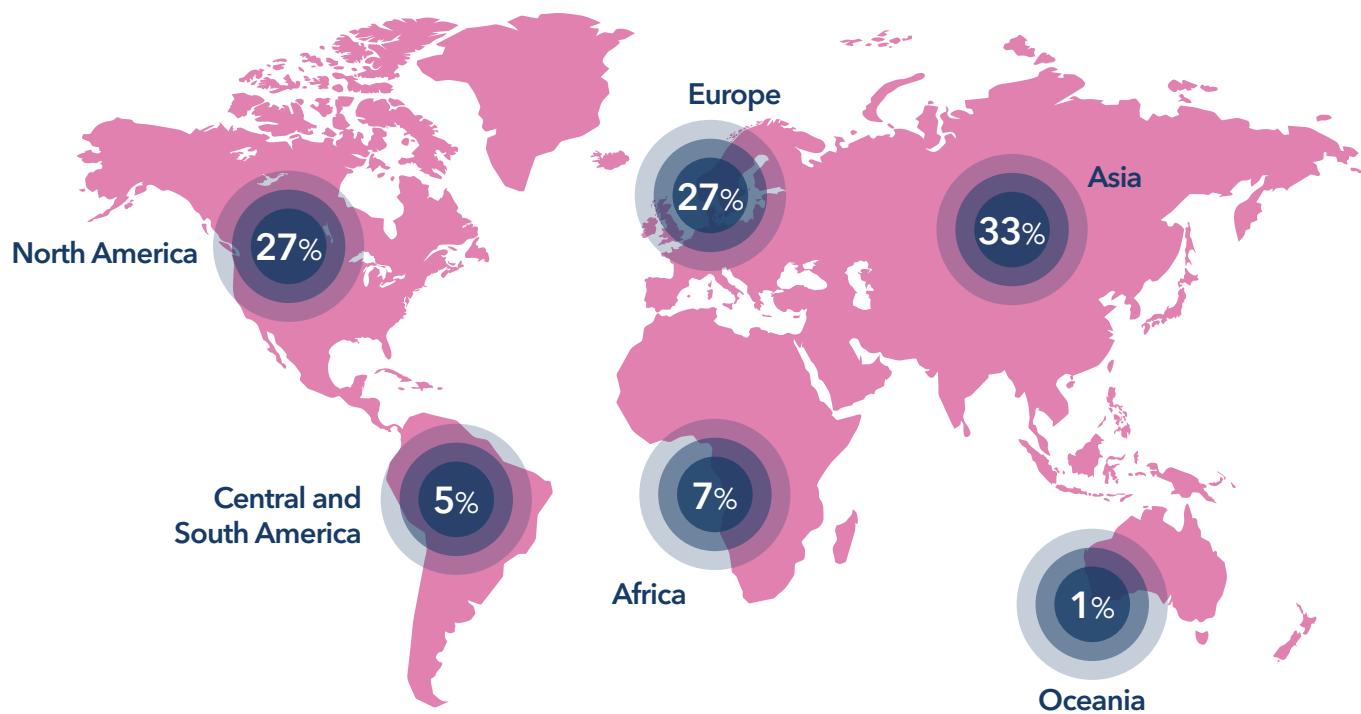
- Slight decrease in percentage of budget allocated to software testing in IT/R&D projects
- Increase in software testing budget expectations for the next 12 months
- Increase in test automation

Respondents confirmed the following trends/technologies and challenges:

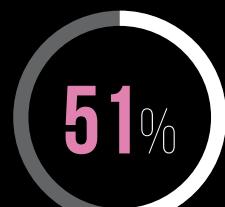
- Agile projects' testing challenges: Test automation, documentation, collaboration
- New technologies or subjects: Security, artificial intelligence, big data
- Trending topics for software testing: Test automation, agile testing, security testing
- Non-testing skills expected from testers: Soft skills, business/domain knowledge, business analysis

The comparisons and analysis indicate that traditional testing practices and techniques continue to be relevant; however, what were the challenges of tomorrow are now realities as reflected in the main areas for improvements and skills requirements for test professionals. Thank you to all respondents for supporting us in this report.

# GEO DISTRIBUTION



# TO WHICH INDUSTRY DOES YOUR ORGANIZATION BELONG?



Information  
Technologies



Financial Services



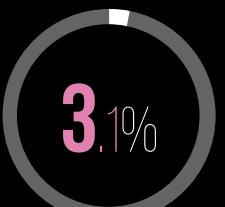
Healthcare and  
Medical



Telecom,  
Media and  
Entertainment



Automotive



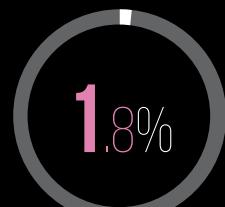
Public Sector



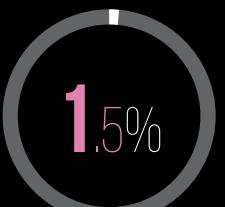
Consumer Products,  
Retail and  
Distribution



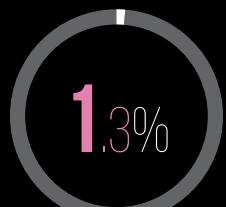
Education



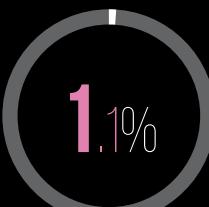
Manufacturing



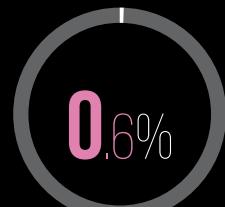
Energy and Utilities



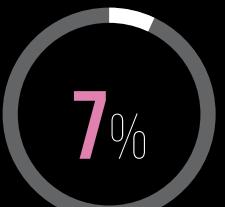
Transportation



Not currently  
employed

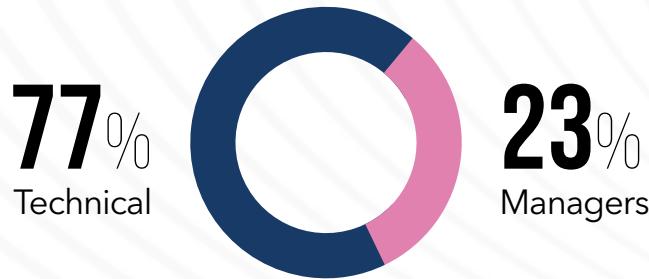
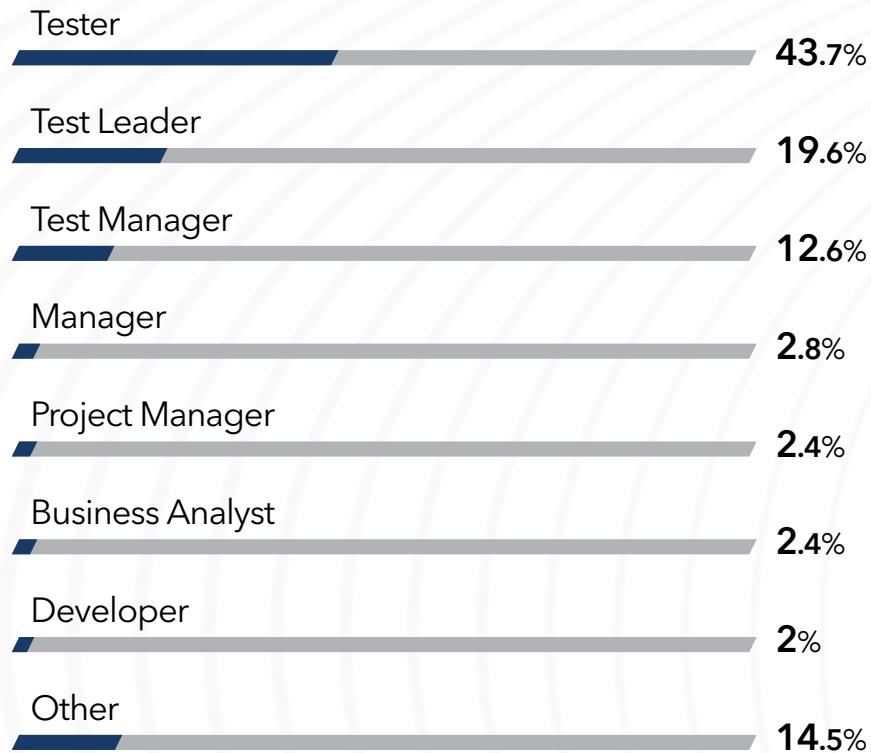


Business Services  
(Hotels, Lodging  
Places)



Other

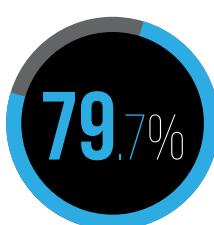
# WHAT IS YOUR CURRENT JOB TITLE?



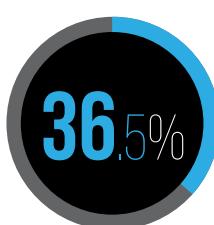
Almost half of all respondents are testers. 77% of responders are working in technical positions and 23% in managerial positions

# WHO IS RESPONSIBLE FOR SOFTWARE TESTING IN YOUR COMPANY?

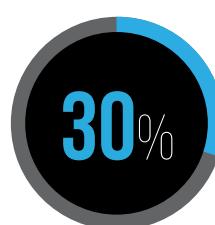
\* Selecting multiple choices were available



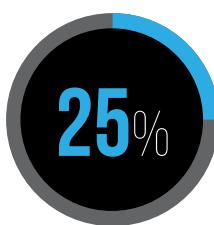
In-house test team



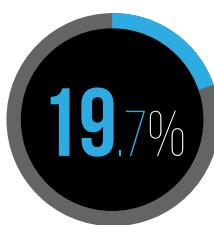
Developers



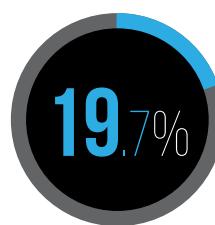
Only in-house test team



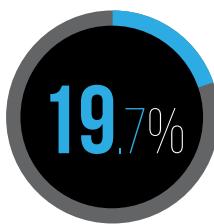
End Users



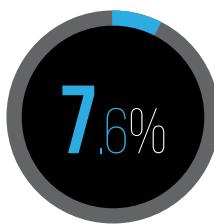
Distributed test team



Off-shore test team



In-sourced test team

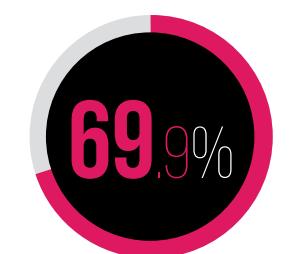


Near-shore test team

Respondents indicated that amongst their organizations a majority are assigning their testing to an in-house test team (79.7%) and 30% of all respondents are using in-house test teams only.

# HOW DOES YOUR ORGANIZATION IMPROVE THE COMPETENCY LEVEL OF YOUR TESTERS?

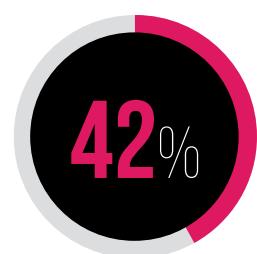
\* Selecting multiple choices were available



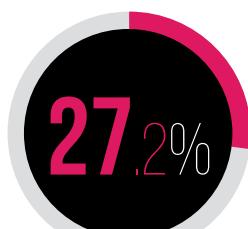
Training on the job



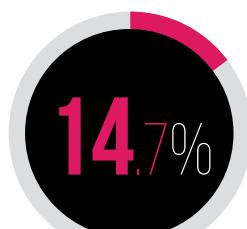
Certification of competencies



Formal training



Participation at conferences

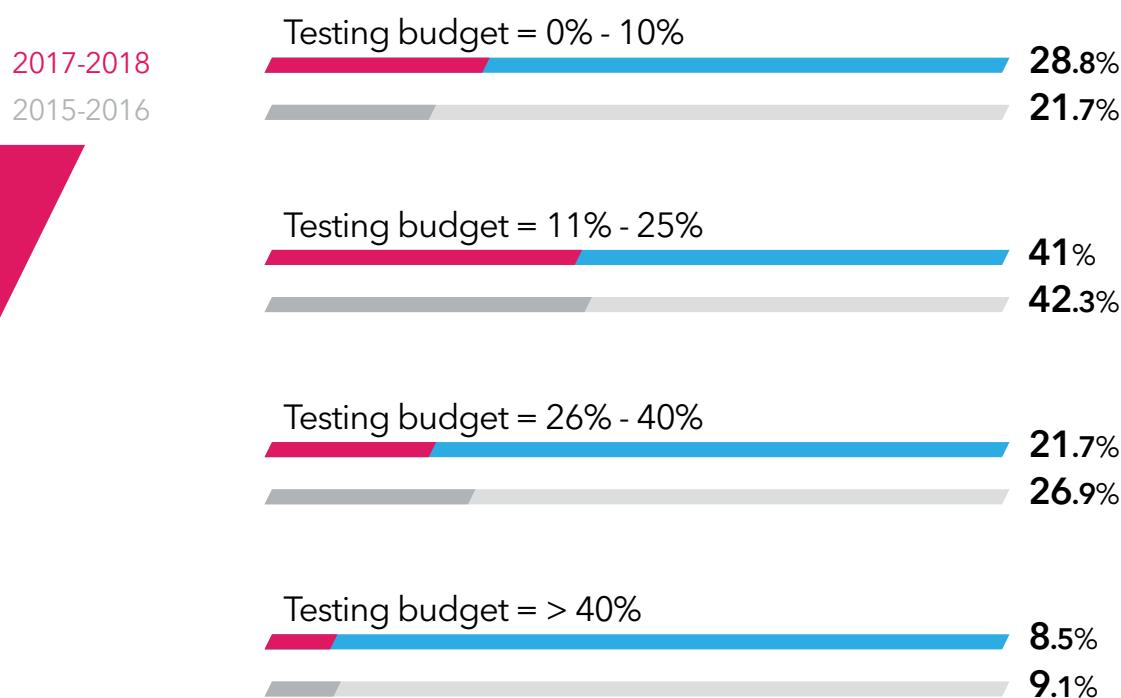


None

Formal training (42%) and certification (50.2%) rated highly as approaches to improving the competency of testers after on the job training (69.9%).

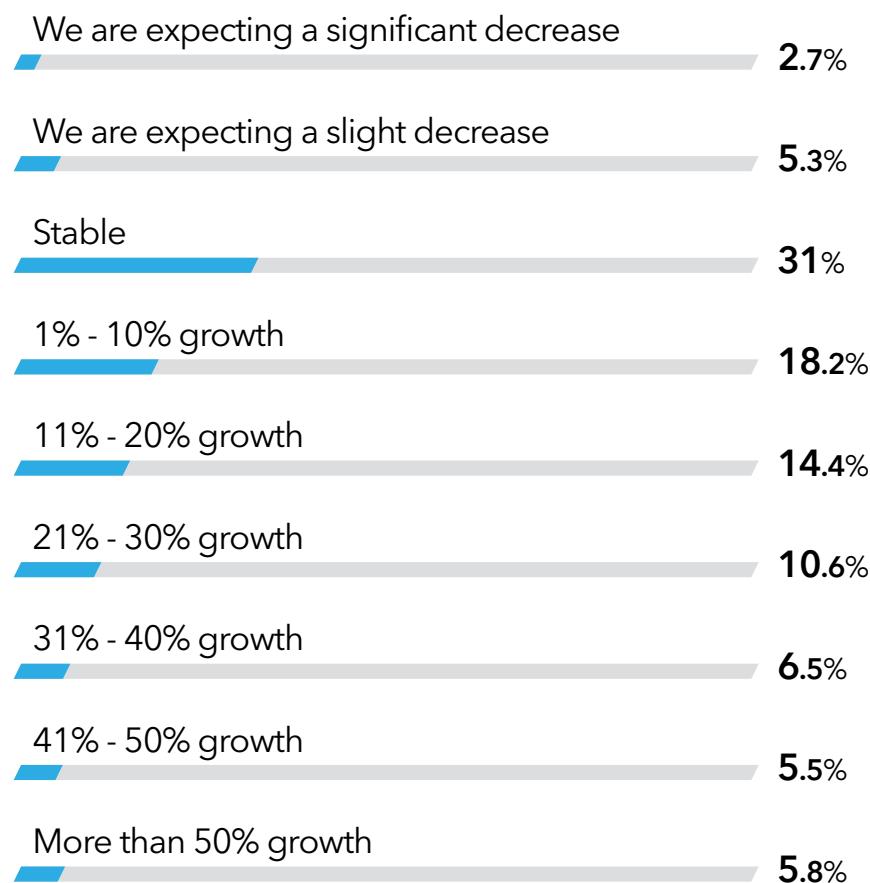


# WHAT PERCENT OF A TYPICAL IT/ R&D PROJECT BUDGET IS ALLOCATED TO SOFTWARE TESTING?

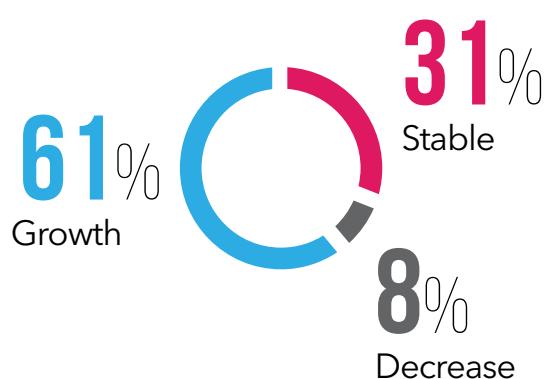


Main testing budget allocation is 11-25% from a typical IT/ R&D project. There is a slight trend to reduce the budget allocated to software testing in comparison to 2015-2016 results.

# WHAT IS YOUR EXPECTATION FOR YOUR ORGANIZATION'S SOFTWARE TESTING BUDGET IN THE NEXT 12 MONTHS?

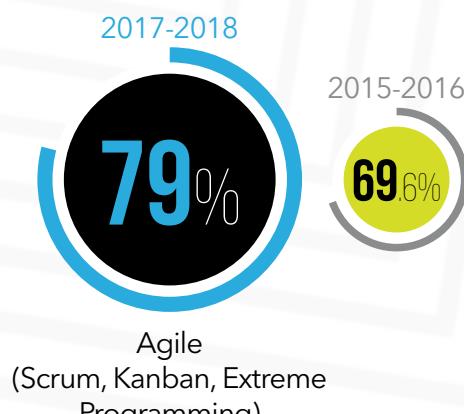


This year respondents are slightly more optimistic in comparison with the previous report, regarding expectations of growth in the budget allocated to testing for the next 12 months (61.1% vs 59.2%)

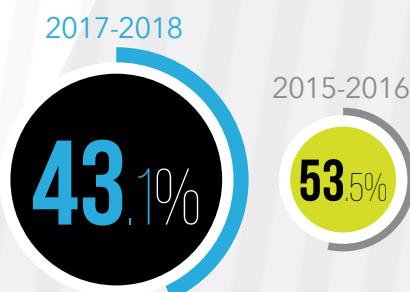


# WHICH SOFTWARE DEVELOPMENT LIFECYCLE (SDLC) MODEL ARE YOU USING?

\* Selecting multiple choices were available



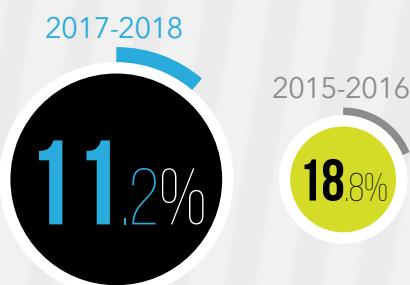
Agile  
(Scrum, Kanban, Extreme Programming)



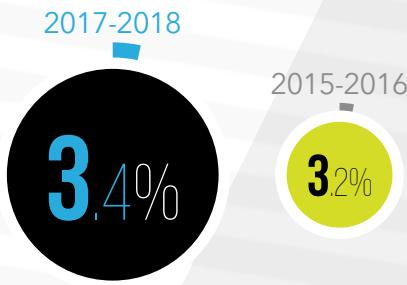
Sequential  
(Waterfall, Vmodel)



Both sequential and Agile



Iterative (RUP, Spiral)

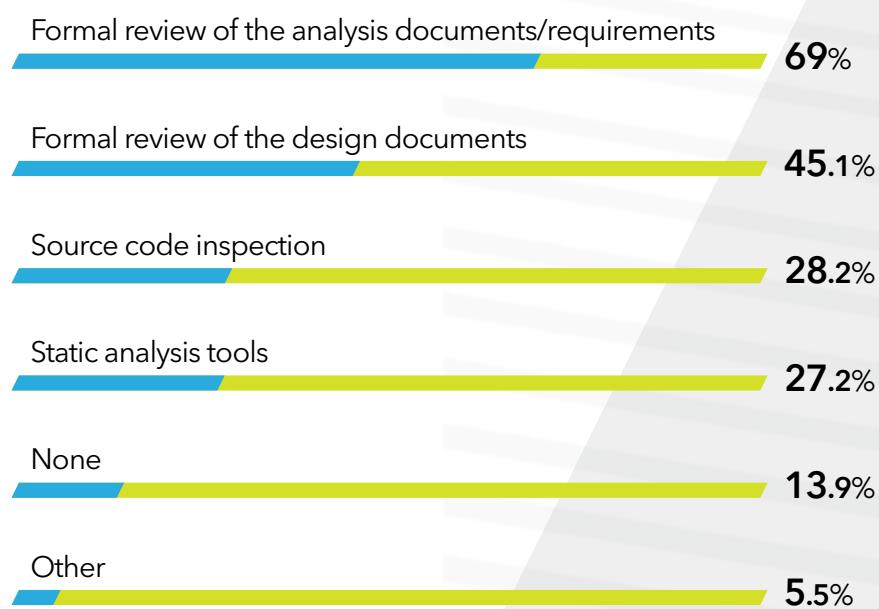


Other

In 2018 we see a shift to more use of Agile models (~10% growth). 26.5% of respondents' organizations are implementing in parallel Agile and Sequential methods.

# WHICH ACTIVITIES DO YOU USE TO FIND DEFECTS BEFORE TEST EXECUTION?

\* Selecting multiple choices were available



Review of the analysis documents/requirements remains the most widespread activity for early detection of defects.

# WHAT ARE THE MAIN OBJECTIVES OF YOUR TESTING ACTIVITIES?

\* Selecting multiple choices were available

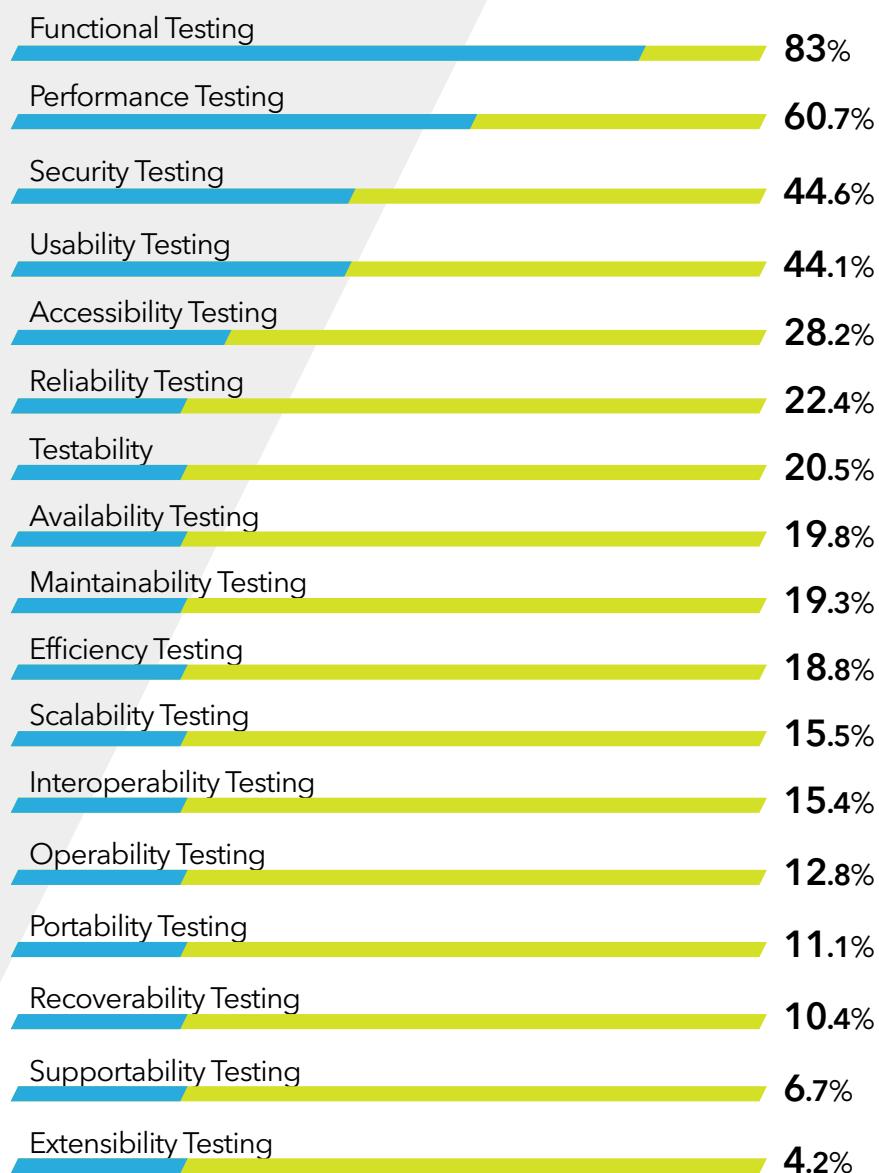
As in the previous report, the main objective of respondents testing activities is “To detect bugs (88.1%). Next top three most popular answers are “To show the system is working properly” (68.6%), “To gain confidence” (55%) and “To evaluate requirements” (51.2%).



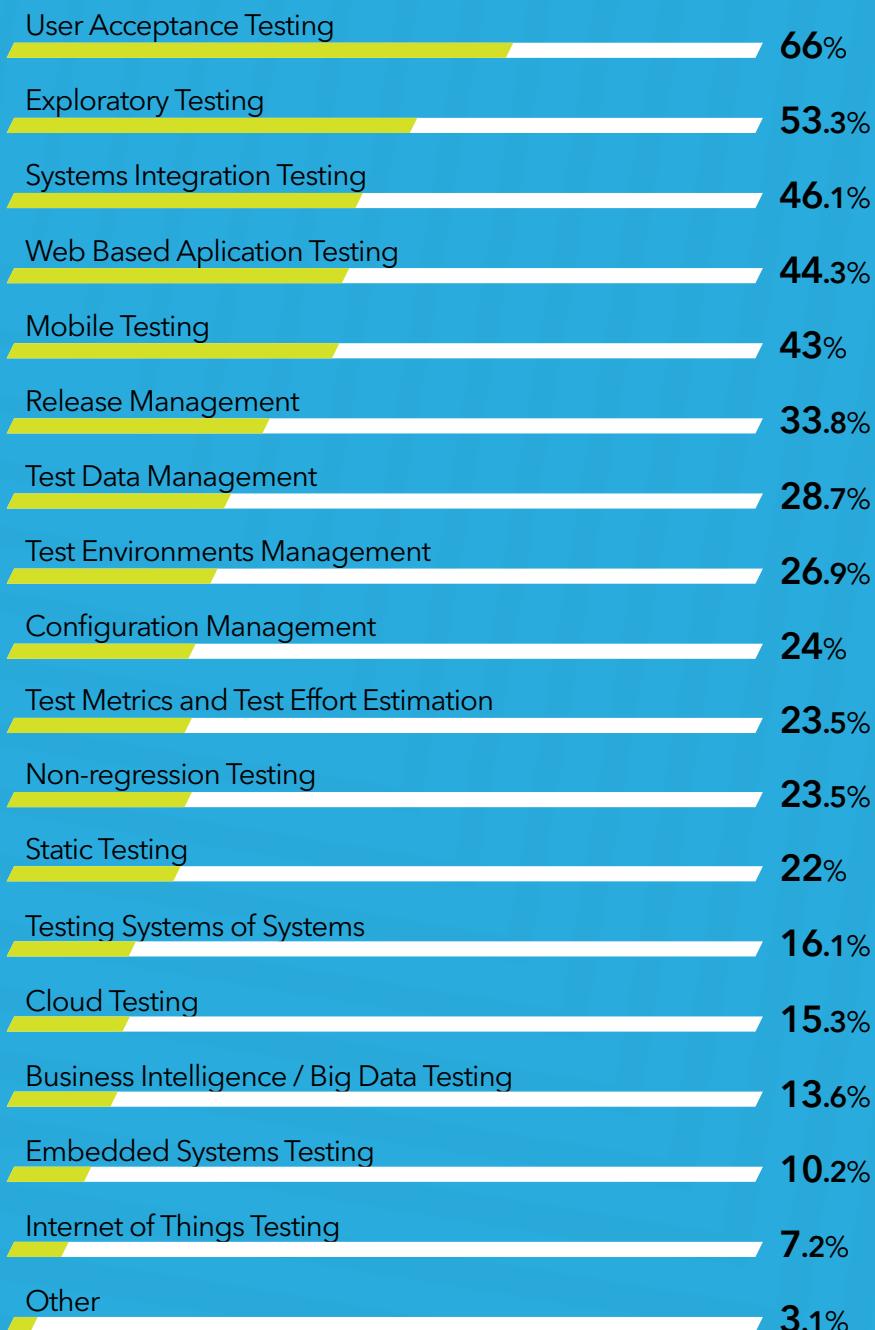
# WHICH OF THE BELOW TESTING TYPES AND/OR TOPICS ARE IMPORTANT FOR YOUR ORGANIZATION?

\* Selecting multiple choices were available

## TESTING TYPES



## TESTING TOPICS

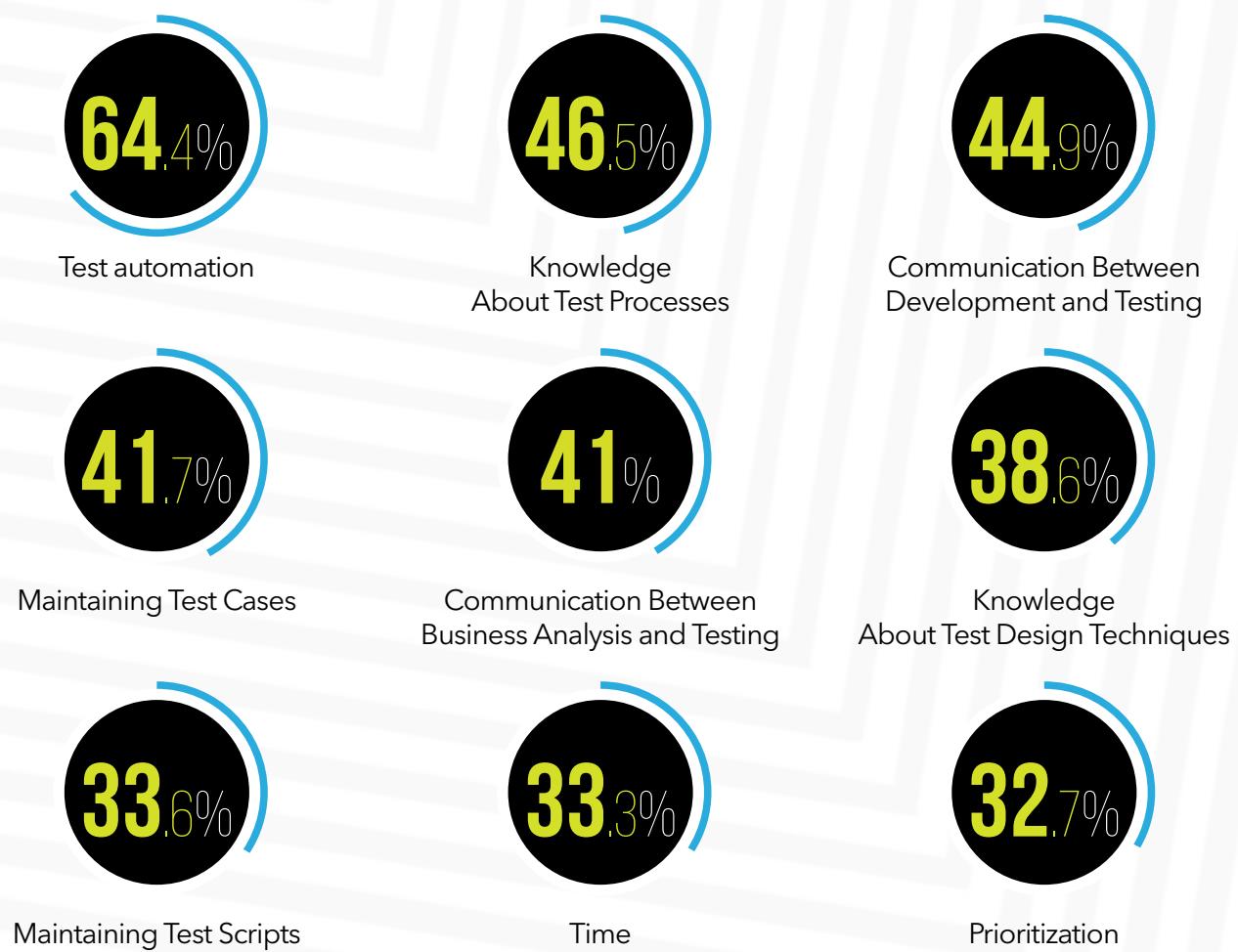


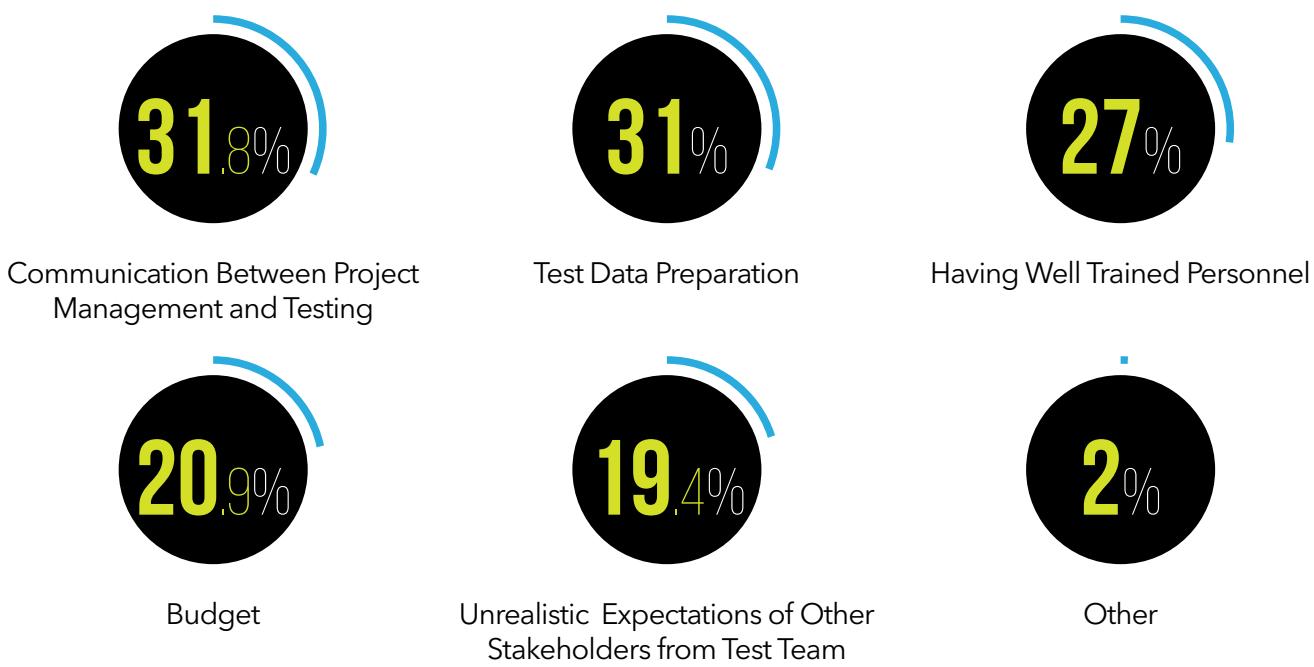
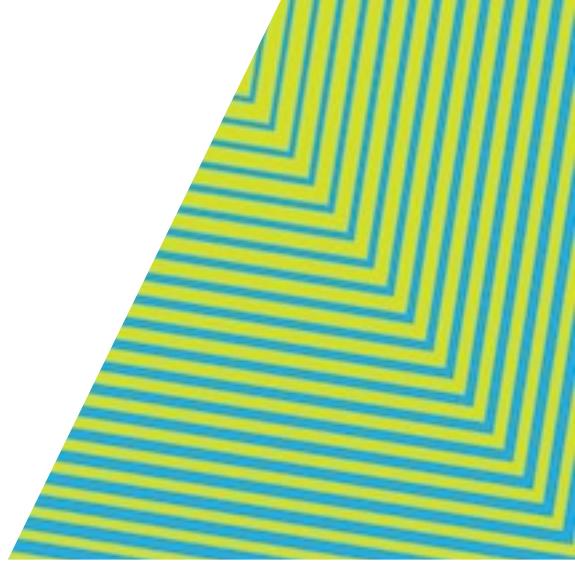
Functional testing (83%) is the most important type of testing in respondent's organizations. This might be expected as without functionality all other non-functional aspects of a system become irrelevant.

With the increasing importance of users, functional testing is followed by user acceptance testing (66.0%). Performance testing (60.7%) is selected as the most important non-functional testing type among all other non-functional test types.

# WHAT ARE THE MAIN IMPROVEMENT AREAS IN YOUR TESTING ACTIVITIES?

\* Selecting multiple choices were available



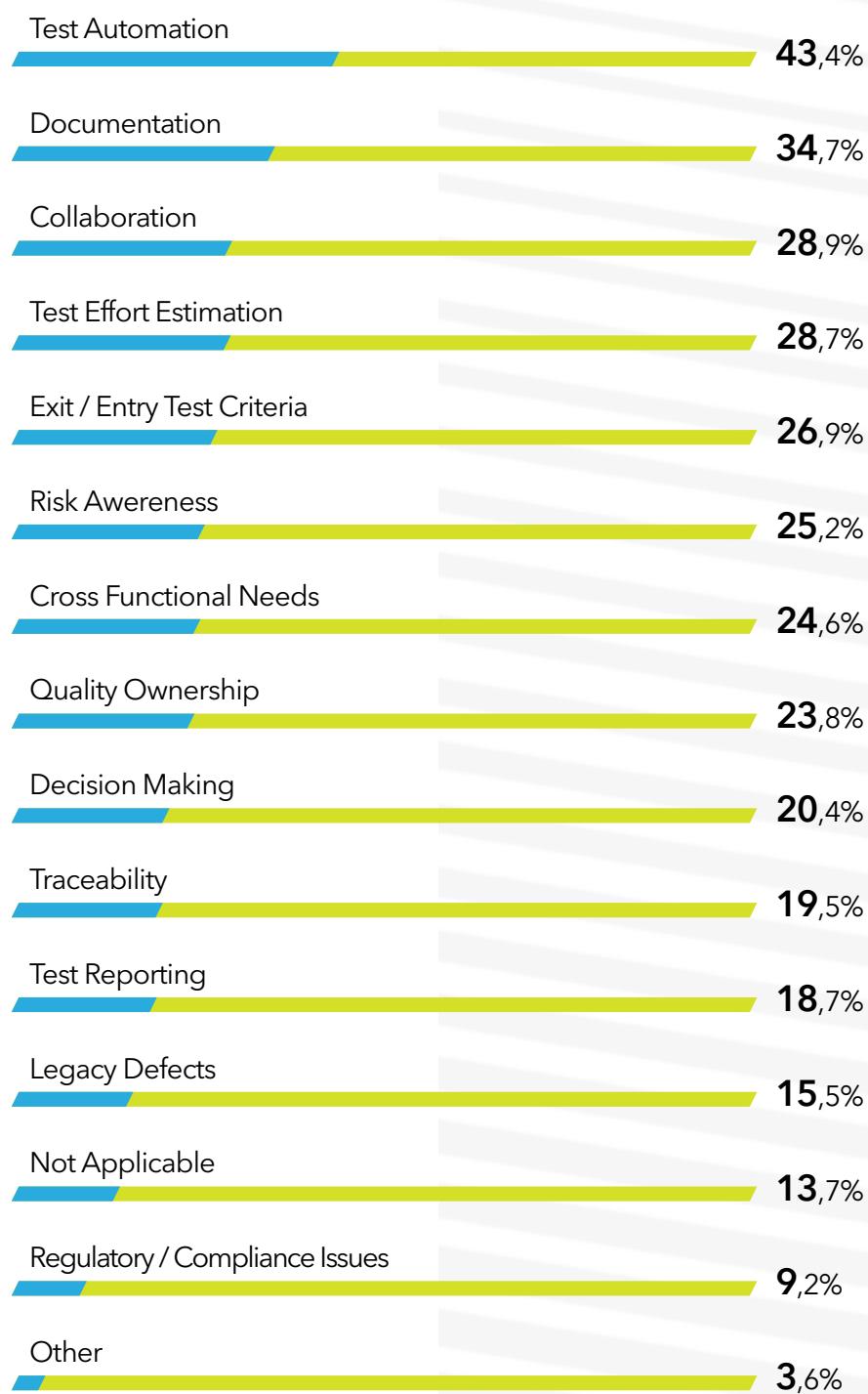


Similar to the previous ISTQB® Worldwide Software Testing Practices Report conducted in 2015-2016, top three improvement areas in testing activities in this year's report are test automation (64.4%), knowledge about test processes (46.5%), and communication between development and testing (44.9%).

The forth ranked item in 2015-2016's report, knowledge about test design, is replaced by maintaining test cases (41.7%) in this year's report.

# WHAT ARE YOUR TOP TESTING CHALLENGES IN YOUR AGILE PROJECTS?

\* Selecting multiple choices were available

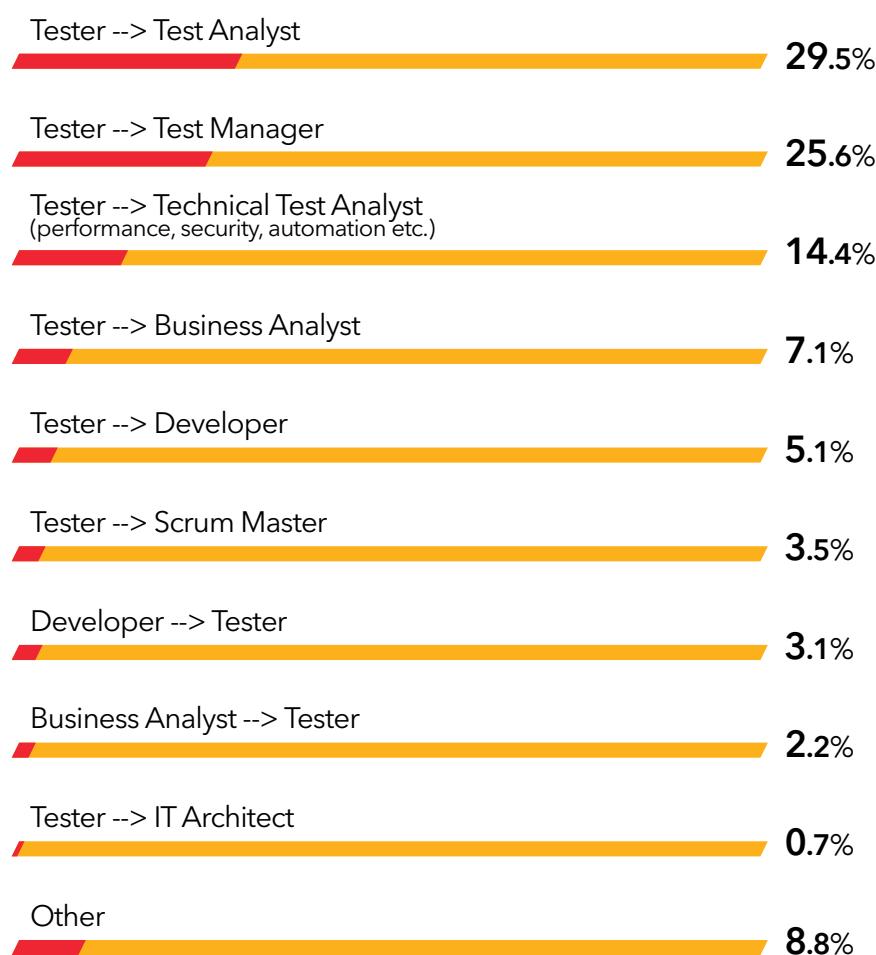


The top three testing challenges in Agile projects are test automation (43.4%), documentation (34.7%), and collaboration (28.9%).

The root cause behind these challenges may be continuously evolving nature of software in Agile projects, cultural challenges/resistance to Agile ways of working.

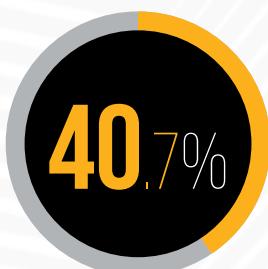
All of these challenges make test effort estimation hard to predict which is the forth ranked challenge in the question (28.7%).

# WHICH CAREER PATH IS MORE COMMON FOR A TESTER IN YOUR ORGANIZATION?

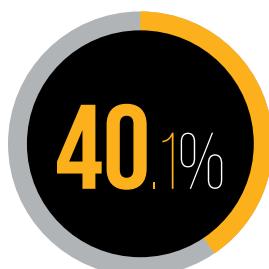


Test Analyst (29.5%) and Test Manager (25.6%) are the most typical career paths for testers within respondent's organizations. No change from the previous report.

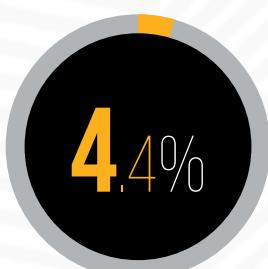
# WHAT COULD BE THE NEXT LEVEL IN THE CAREER PATH FOR A TEST MANAGER?



Test Department Director



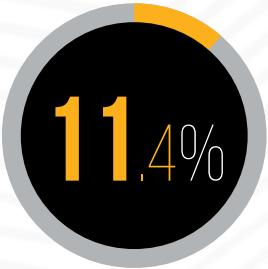
Project Manager



Development Manager



Chief Technology/Information Officer



Other

Test Department Director (40.7%) and Project Manager (40.1%) are the most typical career paths for Test Managers within respondent's organizations. In the last report 44% and 37% respectively for these careers.

# WHICH TESTING SKILLS DO YOU EXPECT FROM TESTERS?

\* Selecting multiple choices were available



Test Execution



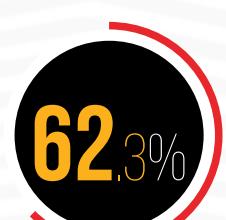
Bug Reporting



Test Design



Test Analysis



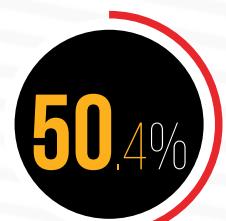
Test Automation



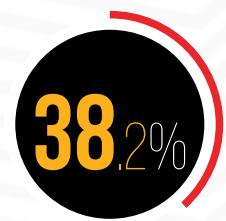
Test Planning



Test Strategy



Test Implementation



Test Monitoring



Bug Advocacy

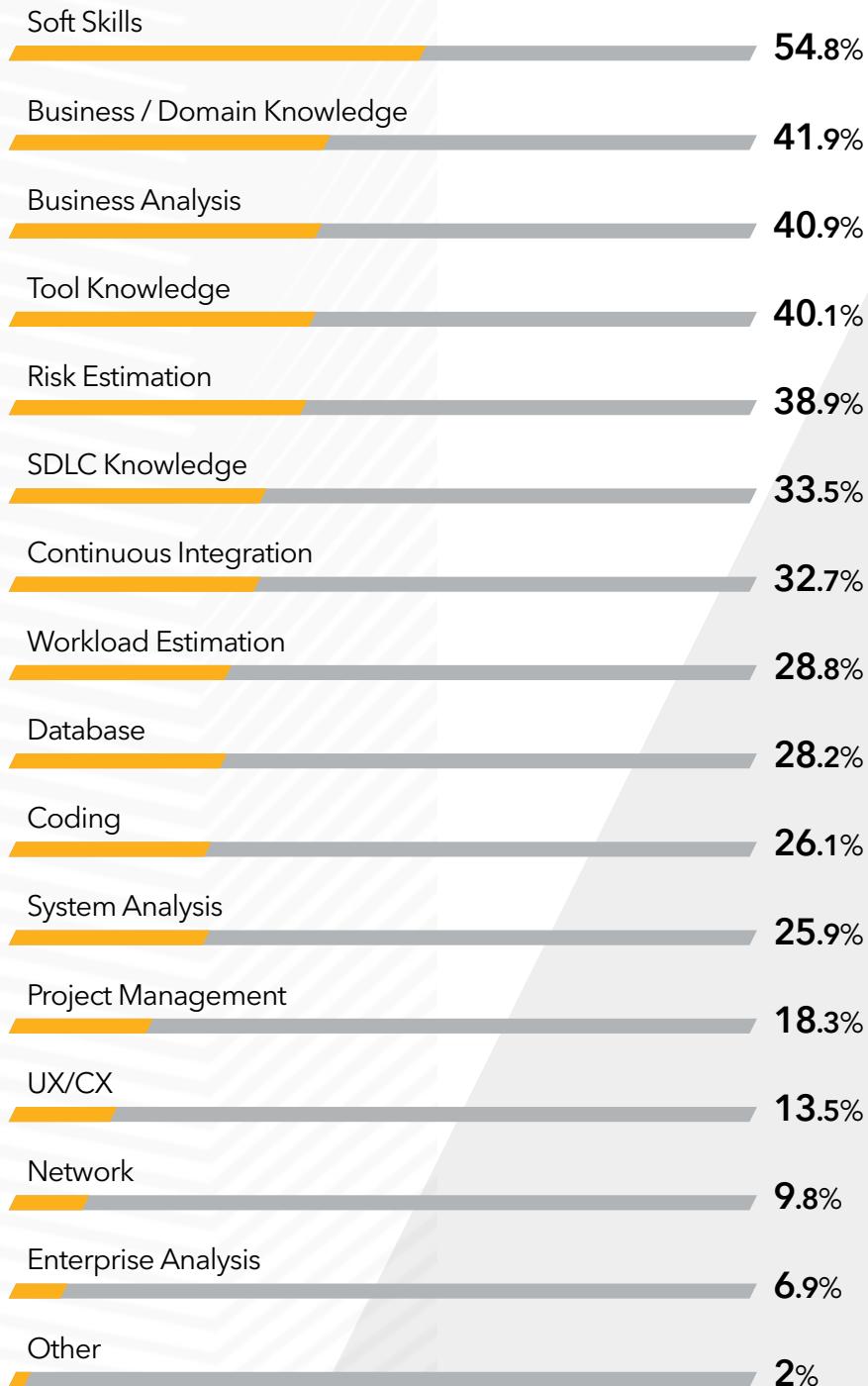


Other

Report results indicate that there are at least eight skills which are rated 50% or above by the respondents. This result shows that a good tester should have a holistic understanding of the testing process which is not only limited to test execution (70.1%) and bug reporting (68.1%). Test design (67.8%), test analysis (67.7%), test automation (62.3%), test planning (60.6%), test strategy (52.9%), and test implementation (50.4%) are as important as or even more important than just running tests and reporting bugs.

# WHICH OF THE FOLLOWING NON-TESTING SKILLS ARE MOST EXPECTED FROM AN AGILE TESTER IN YOUR ORGANIZATION?

\* Selecting multiple choices were available



Soft skills (54.8%) and business centric skills such as business/domain knowledge (%41.9), and business analysis (%40.9) skills are more expected than other non-testing skills from an Agile tester according to the survey respondents.

# WHICH OF THE FOLLOWING NON-TESTING SKILLS ARE MOST EXPECTED FROM NON-AGILE TESTERS IN YOUR ORGANIZATION?

\* Selecting multiple choices were available

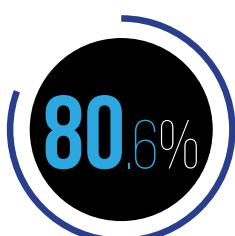




Similar to Agile Testers, Non-Agile Testers are also expected to have soft skills (45.2%), business/domain knowledge (38.9%), and business analysis (37.7%) skills. According to the report, forth ranked non-testing skill expected from non-Agile tester is SDLC knowledge (34.8%) and fifth is tool knowledge (34.1%).

# WHICH TOOLS DO YOU USE IN YOUR ORGANIZATION?

\* Selecting multiple choices were available



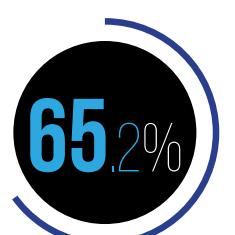
Defect tracking



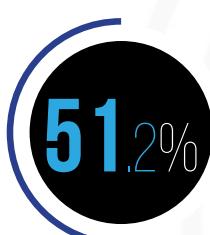
Test automation



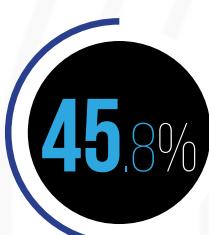
Test execution



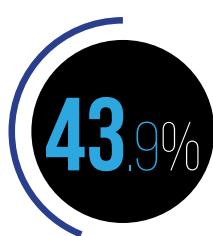
Test management



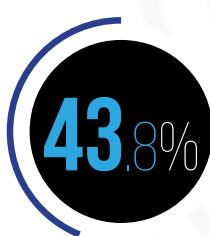
Performance testing



Requirements traceability



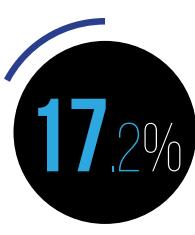
Test design



Unit testing



Static analysis



Dynamic analysis



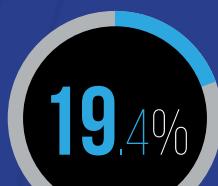
Other

There is no significant change in the types of tools used since the last report. The most commonly used tools among test teams are defect tracking, test automation, test execution and test management.

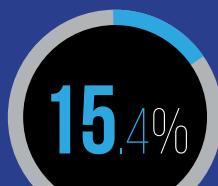
# WHAT IS THE PERCENTAGE OF AUTOMATED TEST CASES YOU USE WITH RESPECT TO YOUR OVERALL TEST CASES?



1% - 10%



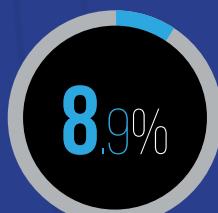
11% - 20%



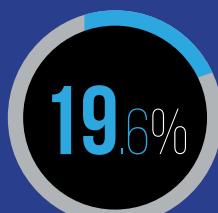
21% - 30%



31% - 40%

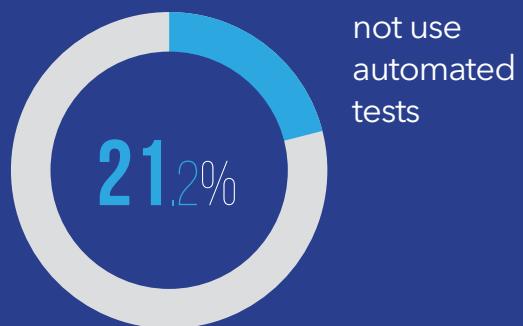


41% - 50%



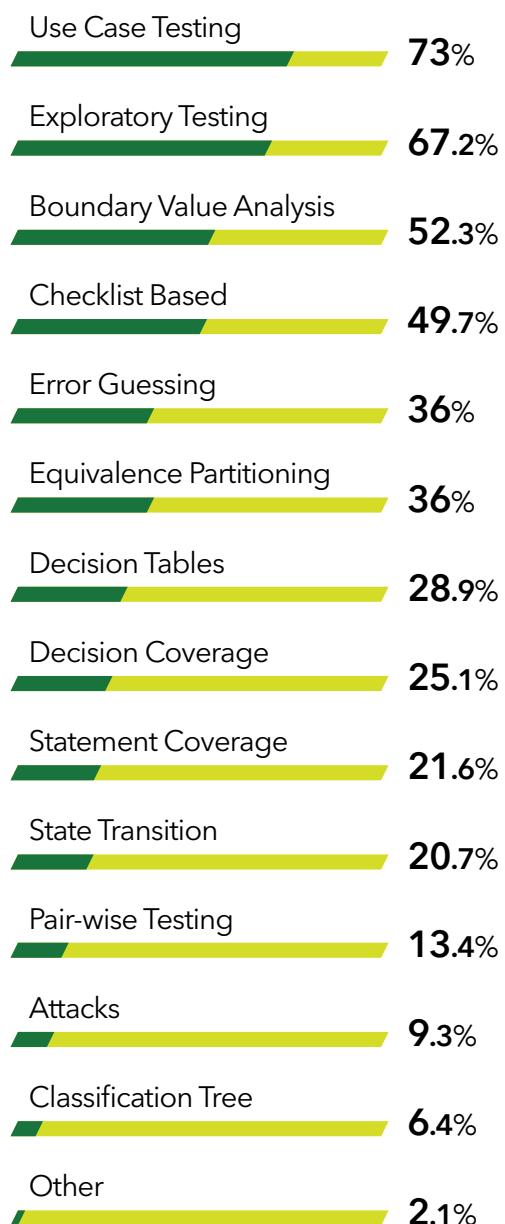
More than 50%

The percentage of companies that do not use automated tests is still high (21.2%). Almost half of respondents that implemented automated tests reported that their coverage is up 20%. Leading industries with coverage of more than 40% are automotive (59.2%) and telecom, media and entertainment (27.1%)



# WHICH TEST TECHNIQUES ARE UTILIZED BY YOUR TESTING TEAM?

\* Selecting multiple choices were available



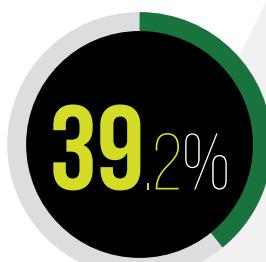
The top five test techniques selected by survey respondents are the same as those selected by the survey respondents for the report conducted in 2015-2016. Beginning from the highest ranking technique, top five techniques are use case testing (73.0%), exploratory testing (67.2%), boundary value analysis (52.3%), checklist based (49.7%), and error guessing (36.0%). Compared to the previous report, only boundary value analysis and checklist based techniques switched their rankings. While the boundary value analysis technique moves up in the ranks and becomes the third ranked item, checklist based technique moves down in the ranks and becomes the fourth ranked item.

# TO WHICH TEST LEVEL (S) IS MOST OF YOUR BUDGET ALLOCATED?

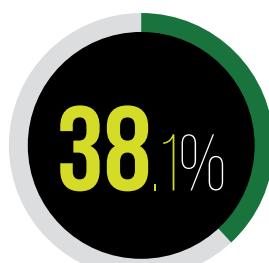
\* Selecting multiple choices were available



System



Integration



User Acceptance



Unit / Component

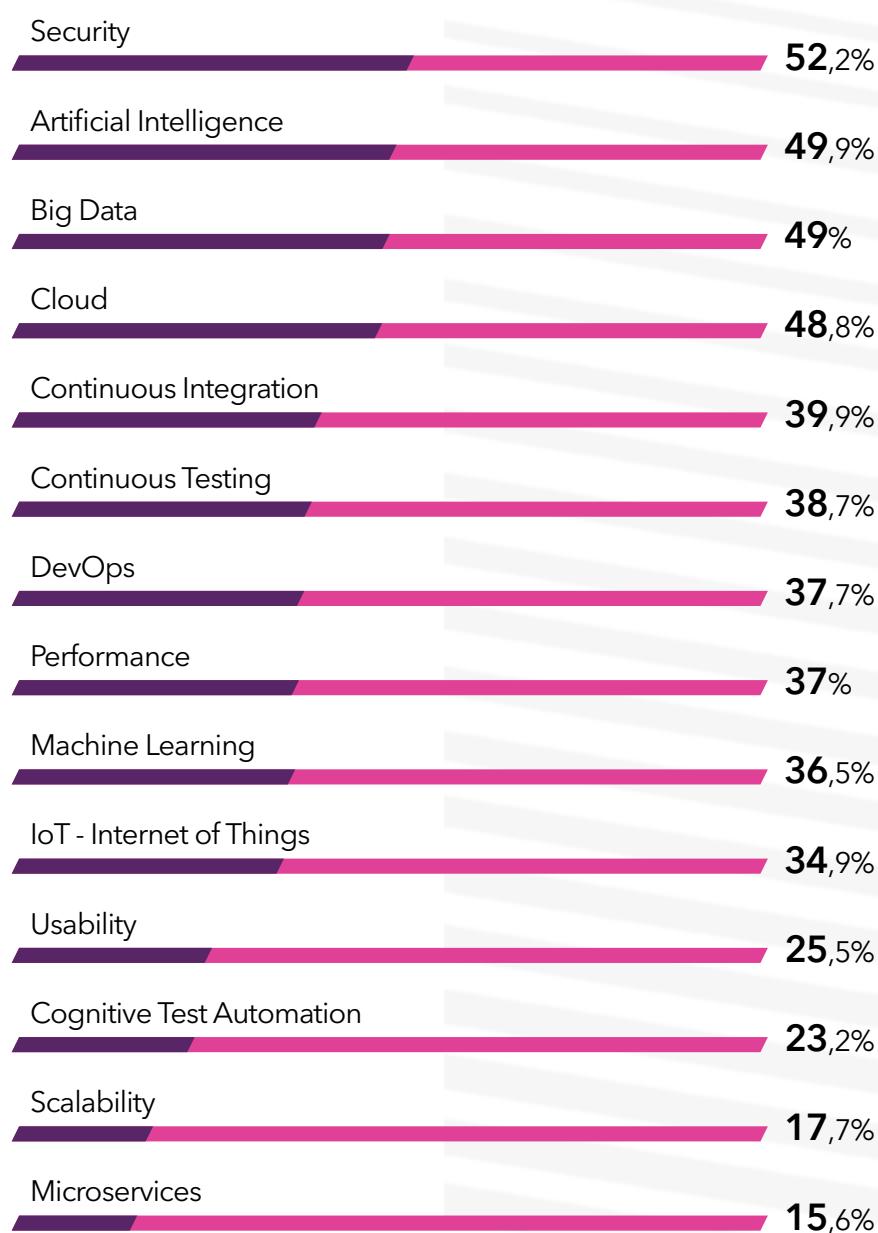


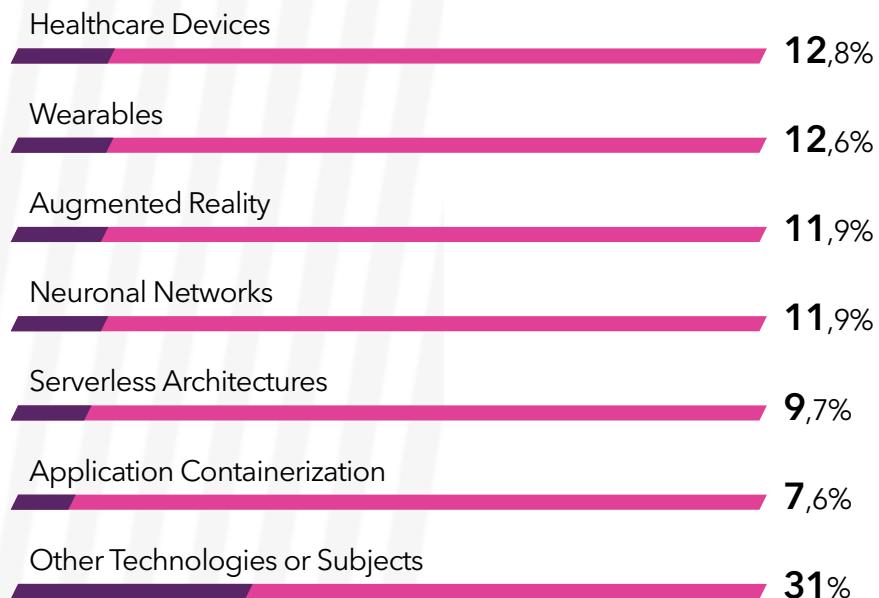
I don't know

There has been no change in ranking since the last report in 2015-2016. Again, system testing (52.1%) is absorbing most of the testing budget; followed by integration testing (39.2%), user acceptance testing (38.1%), and unit/component testing (21.5%).

# WHICH NEW TECHNOLOGIES OR SUBJECTS WILL BE IMPORTANT TO THE SOFTWARE TESTING INDUSTRY IN THE FOLLOWING 5 YEARS?

\* Selecting multiple choices were available

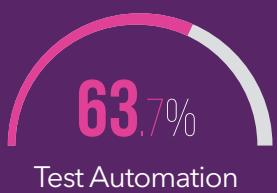




Security testing (52.2%) is considered as the most important subject to the software testing industry in the next 5 years. Exponential growth in computational power and available data make artificial intelligence (49.9%) and big data (49.0%) as the second and third most important subject to software testing industry respectively.

# WHAT WILL BE THE MOST TRENDING TOPIC FOR SOFTWARE TESTING PROFESSION IN NEAR FUTURE?

\* Selecting multiple choices were available



Test Automation



Agile Testing



Security Testing



Cloud Testing



Mobile Testing



Continuous Testing



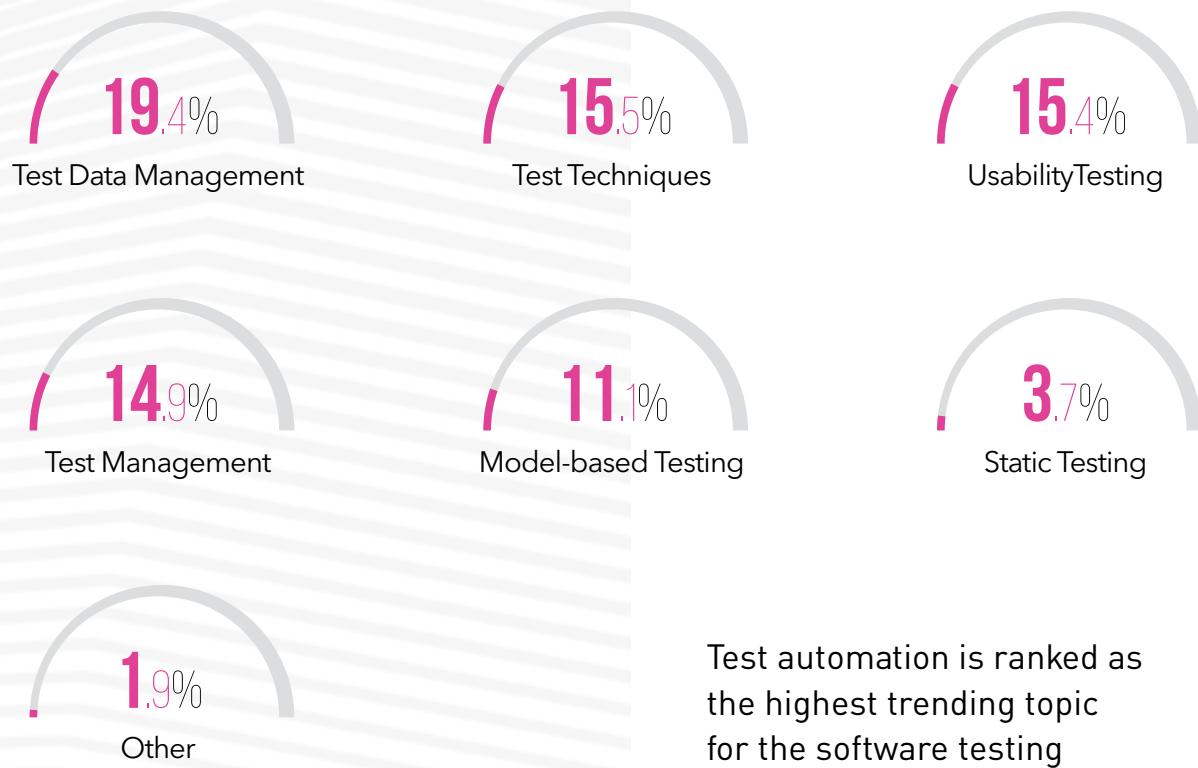
Performance Testing



Virtualization



Test Process Improvement



Test automation is ranked as the highest trending topic for the software testing profession in the near future (refer also to question on page 20 where test automation is also highlighted as the main improvement area in software testing). Increasing adoption of Agile frameworks and growing security issues in IT industry make agile testing (57.5%) and security testing (49.0%) as the second and third most important trending topic respectively.

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