



















Why do we want to know what other testers are doing?



Welcome to the State of Testing Report

Yes, this is our welcome message to this 7th edition of the Report we started back in 2013, but it is a completely different message than those we are used to writing. The message

is different because the world is different, and it would be irrational (maybe even irresponsible) to ignore this fact.

We are being shown how a small virus, that could have passed as a harmless bug in the complex system called human beings, can have a huge impact on the even more complex collection of systems called humanity.

In rational terms, this bug is relatively small and with limited long-lasting effects – it is far from being the imaginary zombie apocalypse depicted in Movies and Sci-Fi books – and thankfully so. Humanity does not think in cold and dry numbers. When we talk about the lives of our close ones, and our own lives we look beyond the cut and dry statistics.

One thing that recent event does show us, is the importance of fast



adaptation to new and changing circumstances. This is a must in the COVID-19 era, but also relevant, more than ever before, to the everyday work of testers. The reality, as we knew it, has changed, and we must adapt, quickly, to keep up with the ever-changing technologies and demands.

The testing community is also showing care for its individuals, with countless acts of solidarity, support and help carried out by members of our profession in all the social and working channels. Even as far from religious as we are, God bless humanity and our irrational behaviors! They are what make us a global human community.

Dear Testing Community, Keep it Up!

Finally, to those who are experiencing, have experienced and might experience personal effects and losses due to this Global Epidemic. Our hearts and thoughts go out to you!

And back again to our humble report.

We are sharing the results and analysis of the 7th State of Testing survey, with the aim of continuously improving our Testing Ecosystem. To learn from each other and become better testers based on the common knowledge, experience and even sometimes the failures experienced by many of us in the past; all of these shared freely so that we can create a better tomorrow.

Please enjoy it, learn from it, share it with others, and strive to become better professionals for the future gains of all of us!

-Joel & Lalit











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PERSONAL INFORMATION





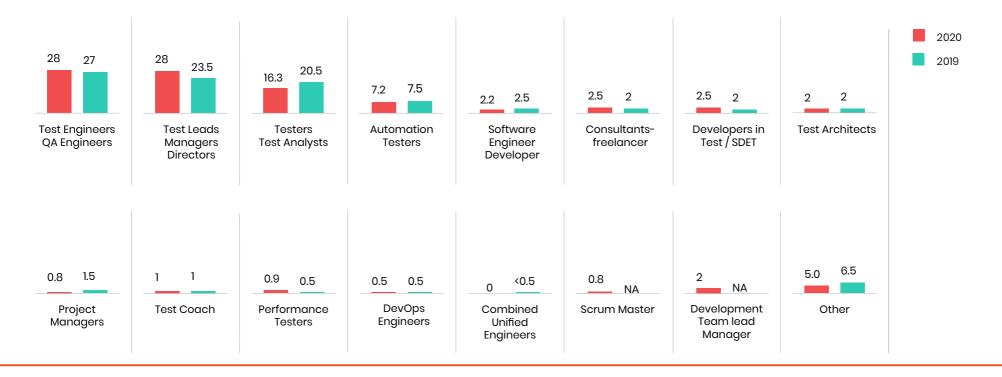




QA Intelligence

Your current testing position is...

Which of the following most closely matches your job responsibility and title?



There are no real shifts in the distribution of people responding to the survey, and we have a very large majority of answers coming from testing professionals. With that said, we have 6.7% of respondents defining themselves as Developers, Dev leads or SDETs. And also less than 1% who define themselves as Scrum masters.

Some of the "other" replies included: Escalation manager, UX Lead, Director of Delivery, several Business Analysts and we have the presence of the Academy like previous years



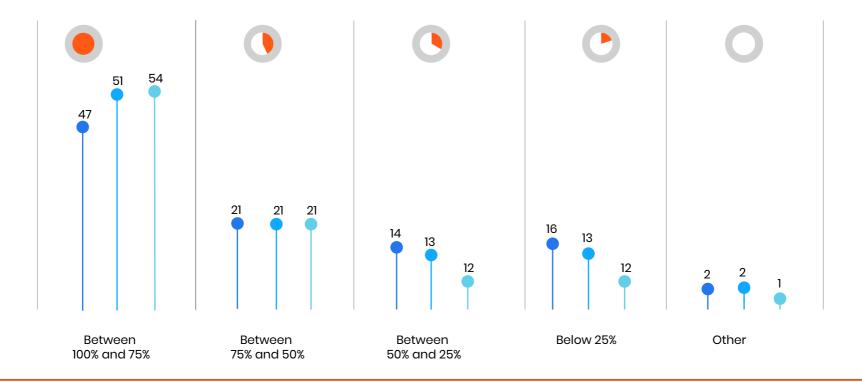
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Is testing 100% of your work?

What percentage of your formal role involves performing testing activities?





2019

2018

This is the third year we ask this question, and at first sight you might think that the numbers look more or less the same as last year, but if we look at the trends, then we can see a constant but slow decrease in the percentage of testers that do testing all the time, decrease that is balanced by the increase in testers doing testing 50% of their time or less.

To us this indicates that testing as a profession is becoming more robust and expanding both left and right, pushing the need to be versatile and to take ownership of additional tasks that add quality value to our teams. What fields and tasks, you may ask? Keep reading and you will see some of these additional jobs we are taking up, on coming pages...

It is also worth mentioning that once we look inside the numbers we see a link between the seniority of testers (how long they've been testing - see the next question) and the percentage of time they spend doing non-testing tasks. To us this means that this is not only related to the organization asking us to do "other stuff" but also to our maturity in the field.



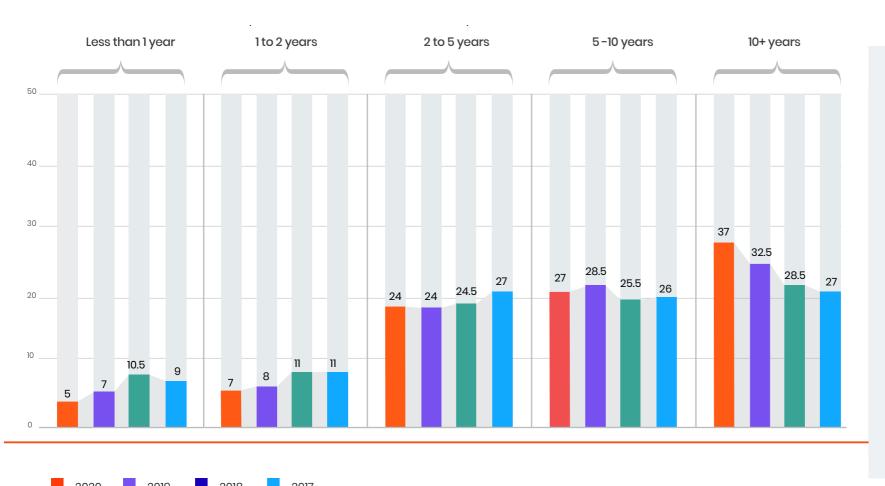






Your professional experience in the testing field is...

For how long have you been working in testing?



It is always good to look at data in the context of a number of years, as this allows us to find trends, and here we may be seeing a general trend where testers are staying in the field for more and more time, meaning that we are becoming Testing & Quality Professionals with years of experience doing our jobs.

This is in line with what we saw last year, where we see a decrease in the percentage of new testers compared with the total testing population

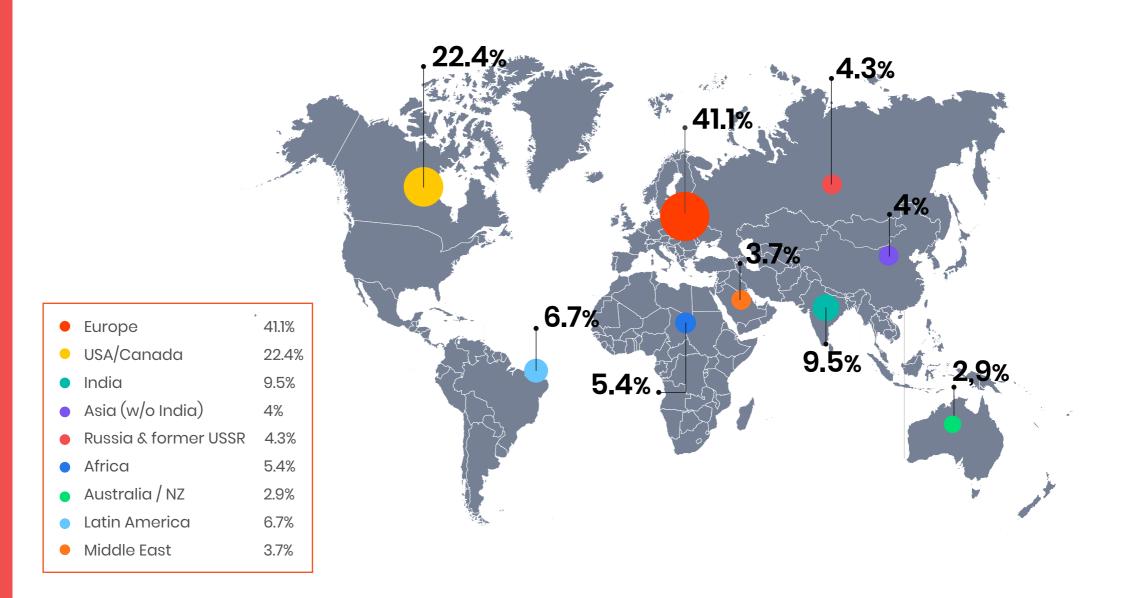








You work in...What Country do you work from?











Your annual income from testing and testing related activities is...

	>1 year	1-2	2-5	5 -10	10+
Africa	7K	24K	50K	78K	NA
Asia	NA	NA	40K	59K	95K
Australia/NZ	NA	40K	65K	76K	87K
Europe	21K	29K	35K	52K	69K
Middle East	15K	NA	NA	60K	86K
India	15K	NA	28K	39K	49K
Russia & former USSR	5K	18K	20K	24K	NA
USA/Canada	52K	68K	85K	89K	111K
Latin America	5K	15K	20K	37K	95K

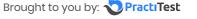
^{*}NA- Not enough data to conclude All numbers are in USD













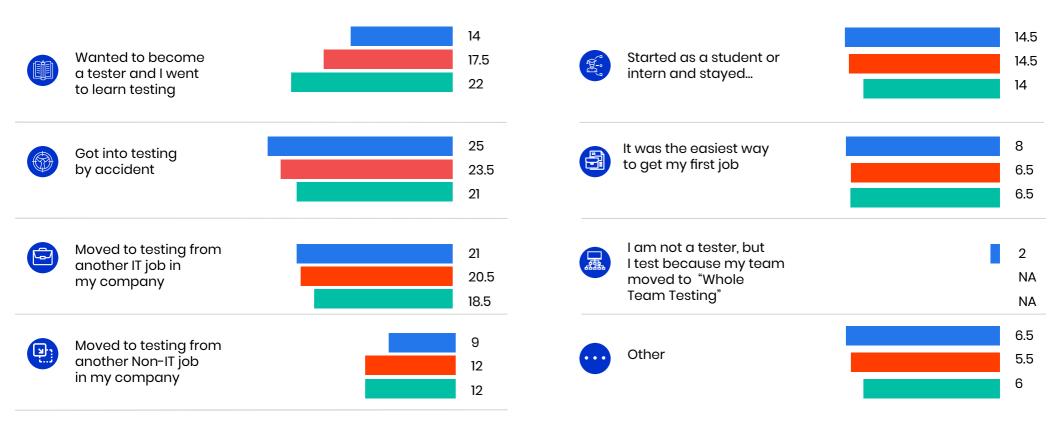






How did you become a tester?

How did you start to do testing as part of your job?



2020

2019

2018

Similar to last year, when we group people who moved to testing internally from other areas within their organizations, they are the largest answer to this question. This reinforces the strength of testing is a career path for people looking to advance professionally.

We also see a continuous decrease in the number of people entering testing via formal training institutions.

Finally, this year we have also included an option of testing as a part of "whole team testing" with 2% of respondents. This is still not a major part of testing professionals, but we expect this number to grow in the upcoming years.





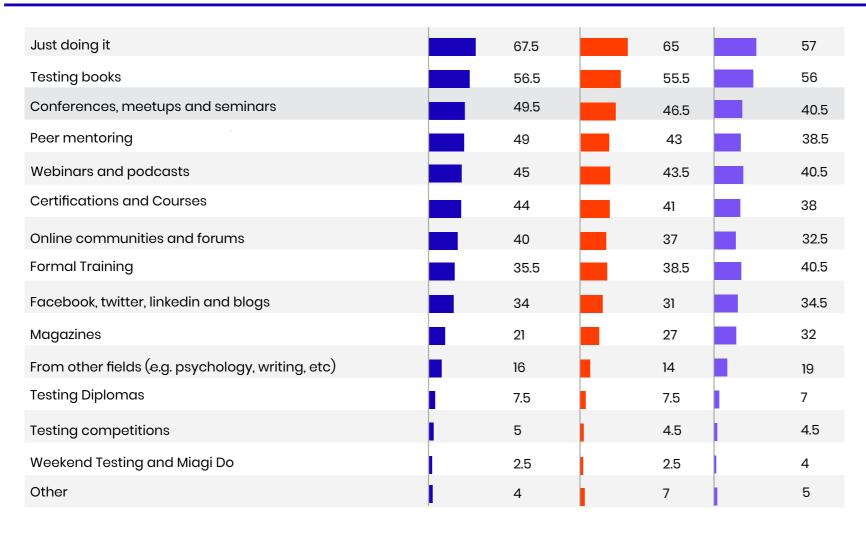






How do you learn "testing" - at present and when you started your career?

What methods do you use today or have used in the past to enhance your knowledge and sharpen your testing skills (Respondents could choose more than one answer)



Similar to what we saw in previous years, more testers are going to conferences and also using online resources to sharpen their skills. while less are doing formal training.

We like looking at the "other" replies in here as they may provide ideas to people on how to continue expanding their knowledge, and so a number of the answers people added were: Udemy test automation academy. Coursera, StackOverflow and talking to other testers in the company.

Food for thought...!

Total can surpass 100% as respondents could select more than one answer









Have you attended any conferences or training sessions in the past 3 years?

What formal or informal training sessions, conferences, seminars, etc (virtual or physical) have you attended during the last 3 years?

OnlineTestConf The OnlineTesting Conference OnlineTestConf	TestBash	Agile + DevOps EAST A TECHWELL EVENT Agile DevOps East	STAR WEST A TECHWELL EVENT StarWest	Automation Guild	QUALITY JAMA ATT. 20018	©EuroSTAR Software Testing Conference Eurostar	Let's Test South Africa
AGILE TESTING DAYS AgileTestingDays	HEISENBUG heisenbug-moscow	WeTest Conference 2018 WeTest Conference	RITIC Romanian Testing Conference	Jyフトウェアチストシンポジウム algan Opmposium ARRIVATOR Distribute Teating JGSST JGSST	COMAQA.BY QA automation community COMAQA	GTAC	QA or Highway Conference
SauceCon	CHALLENGE ACCEPTED qa: challengeaccepted	HUSTEF HUSTEF	expo: QA Expo QA	TABARA DETESTARE Tabara de testare	se SeleniumConf	ASTOB® American Software Testing Qualifications Board, Inc. ASTQB Summit	Q A FEST
TESTISTANBUL CONFERENCE Testistanbul	TEST MASTERS ACADEMY Test Leadership Congress	Nordic Testing Days Nordic Testing Days	CopenhagenContext Dedicated to Context-Driven Testing copenhagen Context	36TH ANNUAL ≥ SOFTWARE □ QUALITY ≥ CONFERENCE OCTOBER 8-10, 2018 PNSQC	NATIONAL SOFTWARE TESTING CONFERENCE National Software Testing Conference, (UK)	CAST	Rapid Software Testing
QA&Test	SIPSOFTWARE TEST PROFESSIONALS CONFERENCE FALL 2018 STP Conf	STAR EAST A TECHWELL EVENT StarEast	TestLeadership Conference	STAR CANADA A TECHWELL EVENT StarCanada	Testing United	angentesting Argentesting	SAEC



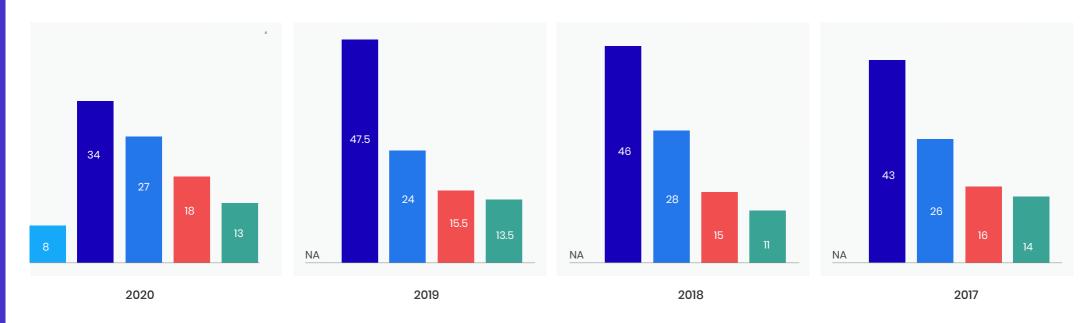




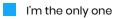


Number of testers in your team/s.

How many testers work in the organization? (if there is more than one team count them all)







2 - 5 Testers

6-15 Testers

16-50 Testers

51+ Testers

Based on feedback we have received in the previous year, we have split the smaller group to differentiate between cases of a single tester in the organization to small testing teams of 2-5 people.

Combining the two smaller groups, we see that there is an overall increase in the average testing team size in organizations, with the lowest group decreasing from 47.5% to 42%. We will need to keep our eyes open on this metric, as it comes as a reverse from the trends we had been seeing previously of testing teams shrinking in size.

A possible explanation - to be reviewed - might be that as companies realize that testing is not a trivial task to be done only by Developers and DevOps engineers, they move back to incorporating dedicated testers into their Agile and DevOps teams. Something to keep looking at.



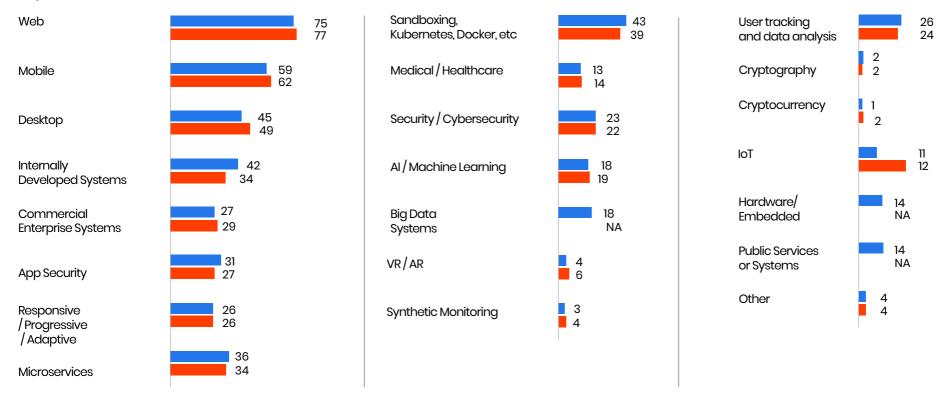






Systems and technologies being tested

Which of the following systems and technologies is your company currently using, developing and testing? (Respondents could choose more than one answer)



Microservices and Containers continue to grow in presence, in accordance with our assumption that these technologies will continue to be relevant in the upcoming years.

We also see that even if most people answered they are testing Web and Mobile, we see these answers in a small decline, a reason for this may be that more companies are developing products that are going to be reused by other companies, and so they do not include any web or mobile client in them... In the "Other" category there were technologies such as Automotive, ERP, networking, and communications.

We believe that new and newer technologies coming in and the challenges they pose create more opportunities for testers, which compels us to learn new things and come up with interesting strategies, toolings, frameworks, and methods. This is where learning from each other, through conferences and other modern platforms seem to have become more relevant. It is interesting to notice how the questions raised by some trends in the survey are partly answered by other trends we come across.





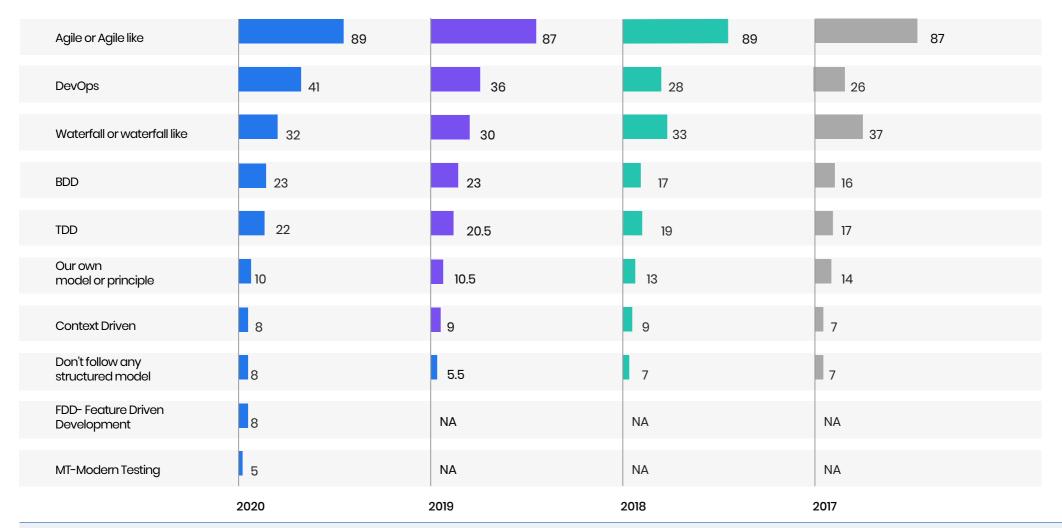






Development and Testing models or principles followed in your organization

What type of development models or principles do you follow in your organization? (Respondents could choose more than one answer)



Agile keeps being the most relevant development approach growing even more compared to last year, fulfilling our assumption of growth. Following last year's results, DevOps is the second most common model, passing Waterfall, jumping in another 5% compared to last year. Surprisingly, we see a small rise in Waterfall presence (32% compared to 30% last year), but we will need to see if this represents a trend. This year we have also included FDD and MT, both showing presence (8% and 5% respectively).

Finally, it is interesting to see that an important number of organizations are working without following any structured model. Something that makes us wonder if this is because they have their own model or because they work in a completely unstructured way.

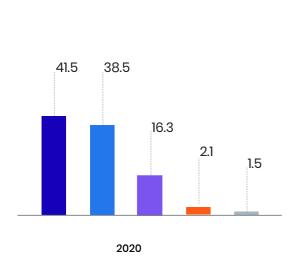


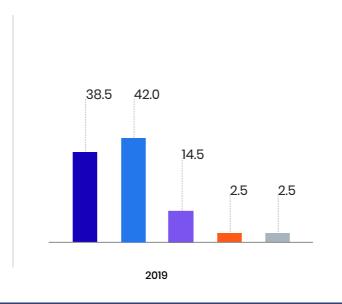


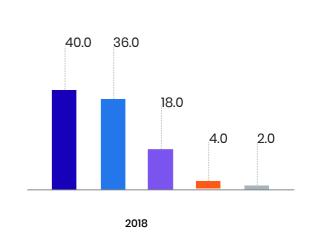


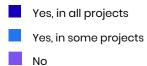


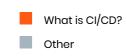
Do you work with CI or CD (Continuous Integration or Continuous Deployment) in your organization?











This year's results show a greater usage of CI in all projects, although the overall usage of CI remains the same (roughly 80%).

The question regarding testers' involvement in this process remains. In our minds, testers should be a part of the definition and execution of the CI process, given the Quality aspect of it, and the overall importance to the stability of the product being developed.





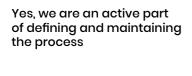






Is the testing organization part of the CI/CD process?

Do you work with CI or CD?



46%

Yes, we get the reports and we can use them as feedback for our testing

15%

We do not have CI/CD or we are not part of it

16%

No, we know there is CI/CD but we are not part of this process

15%

No, we get the reports but we cannot do much else with them

8%

We added this question on the current survey to review the involvement level of the testing team as part of the CI/CD process.

In accordance with the comment in the previous question, we see that over 61% of the answers testers are involved in one way or another as part of the process, either as full members or at least as "internal customers" of the reports. We believe that in the remaining 39%, testers can play a more meaningful and active role, and get involved in some aspects of the CI/CD process.











TESTING IN YOUR ORGANIZATION





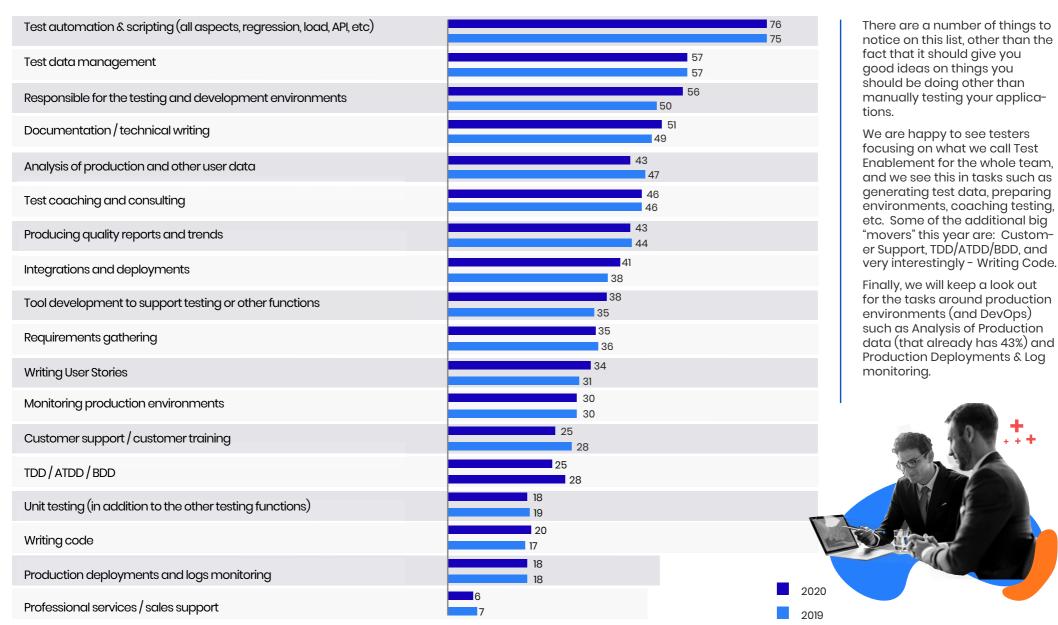






Tasks of the Tester in your organization

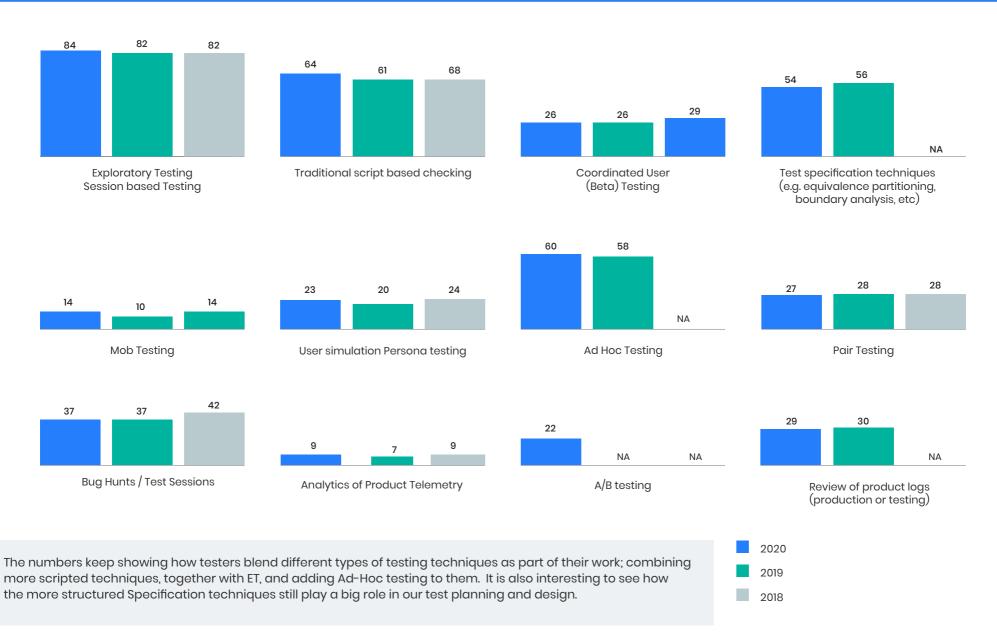
What tasks do testers perform in your organization other than testing? (Respondents could choose more than one answer)





Testing Techniques and Methodologies

What testing approaches do you use during your testing activities? (Respondents could choose more than one answer)



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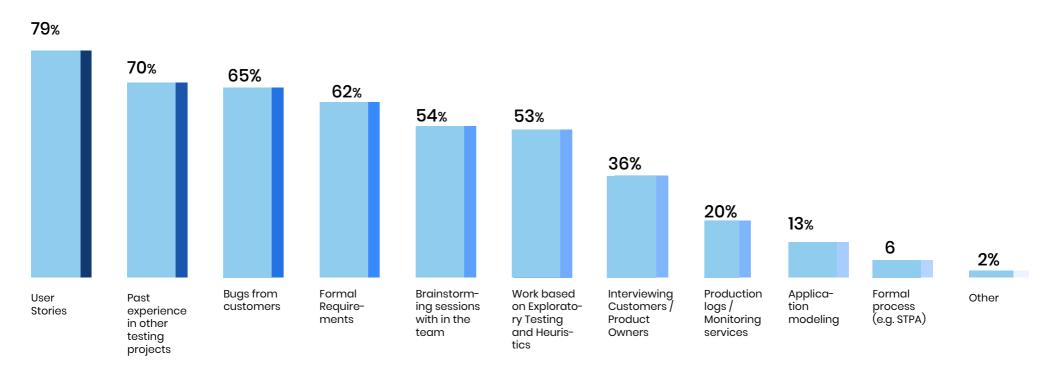






Sources for testing information

How do you know what tests you need to run or write for your testing operations?



Similar to the results of previous years. User stories and formal requirements are an important source for getting the needed information to decide what to run. The other sources of information on the top of the list are the obvious bugs from customers and past experience, which becomes the 2nd most important source of knowledge. With the industry growing professionalism and years of experience, this comes with no surprise







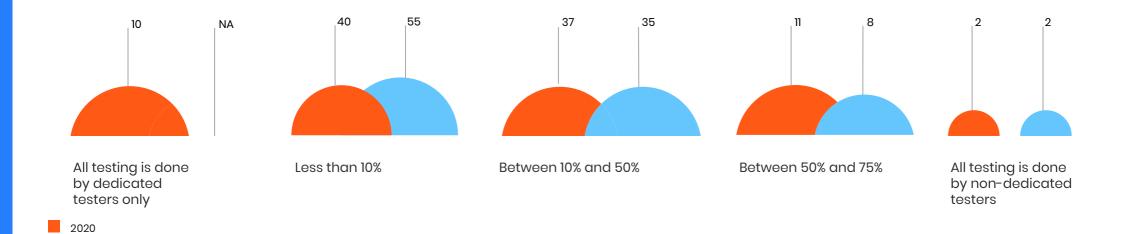
2019





How much of your testing is done by non-dedicated-testers?

In many organizations other team members also take part in the formal testing process. (Developers, Product Owners, Support, End Users etc.)



We separated the first 2 categories to check what percentage of teams are still leaving testing tasks specifically to testers. We see this in only 10.5% of cases. We also see that if we add the first two categories together there is a decrease in the percentage of people answering that 90% to 100% of the testing is done by testers.

This is complimented by the fact that organizations where less than 50% of testing is done by testers has increased from 10% to 13% percent. Showing that the "Whole team testing movement" is not only a theoretical idea.





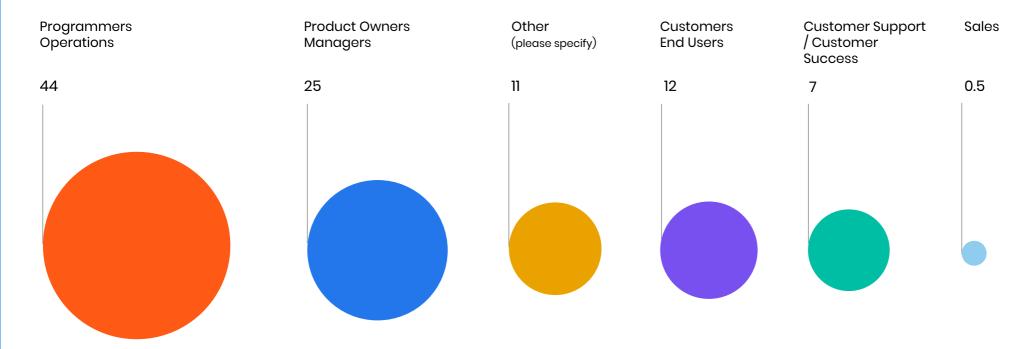






Who else participates in testing in your organization

Following up on the previous question, if there are people running tests in your company who are not dedicated testers, we want to know who these people are.



Not surprisingly, Programmers are the largest group of non-testers who perform testing activities. Product managers also contribute their part in about a quarter of the organizations. Interesting to see, however, is the participation of customer-facing roles such as customer success/support, which indicates the shift testing is going from finding bugs to ensuring product quality.

There were many answers among the others, some of the most interesting ones where UX Experts, Domain Specialists, and Managers.





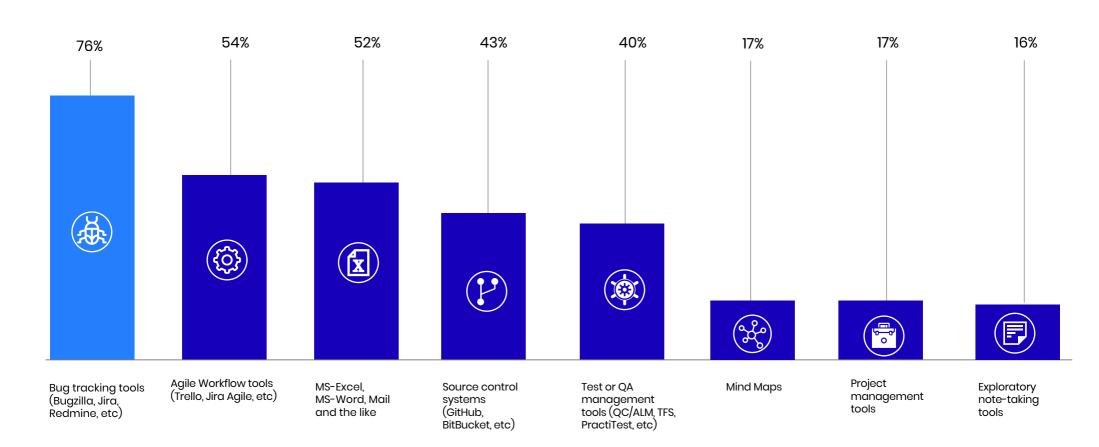




QA Intelligence

Test management tools

What tools do you use to manage your testing?



As more and more teams work Agile, we see Agile Workflow tools taking a big part of the test management efforts, but we also see how many non-testing or even development systems such as Office and Email take an important part as well. Compared to previous year, we see a decrease in the use of Mind Maps and ET note-taking tools.





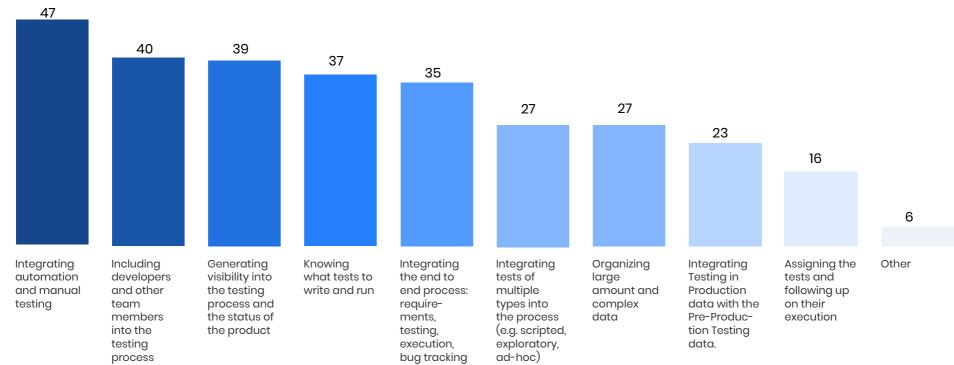






Test Management Process

What are the biggest challenges affecting test management and communication in your team? Respondents could choose more than one answer



With the growing presence of automation and all team testing, it is of no surprise that the among the biggest challenges we see Integrating manual and automation testing results, and Generating testing results' visibility.

Among the other answers we saw some interesting ones:

- Coordinating time-limited resources.
- Coordinating a small team taking care of a large number of projects
- Integrating a testing process of components coming from multiple external companies.
- Getting Senior Management to understand the testing process.
- Prioritizing testing tasks
- Coordination of user-testing



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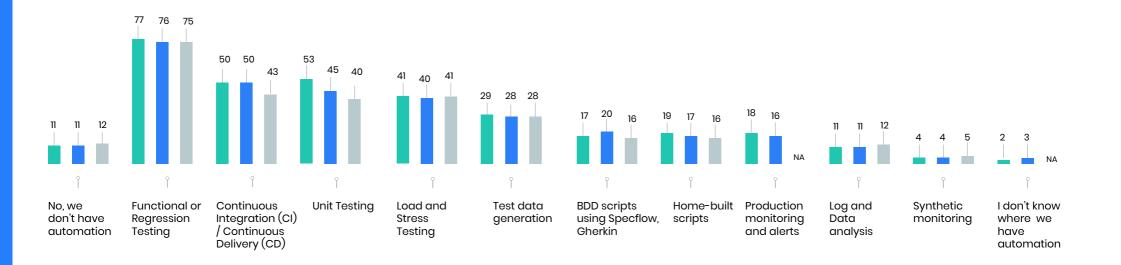






Scripting / Automation

Where do you use scripting and/or test automation in your organization?



We see unit testing as a rising answer. This is encouraging in two ways, first it might mean teams are investing more in this aspect of the testing process, but it also may mean that testers see Unit Testing as a part of their domain as we expand our responsibility to more of the testing activities happening in the development.

We also see a decrease in the use of Data analysis as well as in the use of BDD.

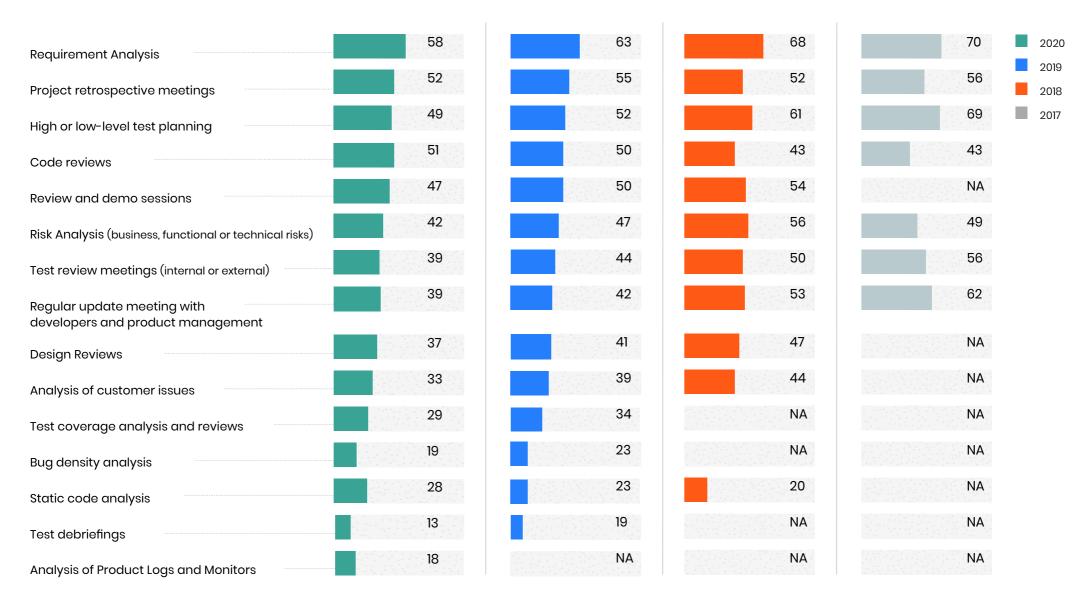








Static QA activities



Overall we see a decrease in the use of Static Activities, this is something we need to keep reviewing in future years. The only exception here is the constant increase in Static Code Analysis that has been on the rise for 3 years now.





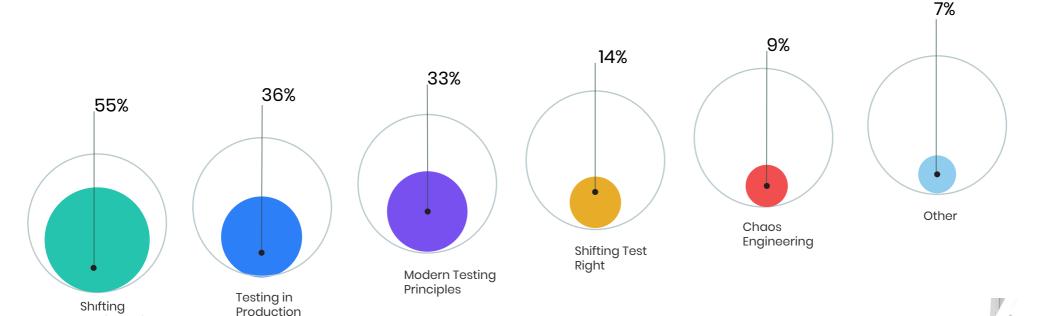


Testing Left



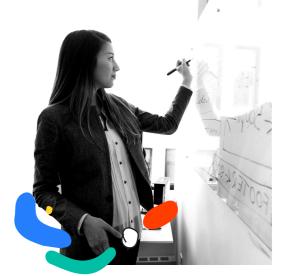
Adoption of testing processes or techniques by your organization

What techniques or processes are you following or implementing?



These moves from more traditional testing into the more current testing process are encouraging. We see how testing is shifting left as well as right, with an important number of respondents saying they are formally testing in production - a great step forward for Quality Engineering.

Another interesting and important finding is to see that a third of the people answering the survey mention the adoption of "Modern Testing Principles". These numbers are a bit high and they may be a result of sampling bias - given a number of the organizers of the survey belong to the Modern Testing community. In any case, we still recommend people reading this report to review the Modern Testing Principles as put forward by Page & Jensen.



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2020 2019 2018



Test documentation

What type of test documentation do testers create in your company? (Respondents could choose more than one answer)

Test Reports	60	65	61
High-Level test plans	50	53	61
Checklists	49	52	51
Detailed test scripts	45	45	50
Low Level test plans	35	36	38
Dashboards	35	33	35
Mind maps	23	29	26
Test charters	18	20	19
Lean documentations	9	12	17
Live documents (Specification by Example, BDD, etc)	18	20	15
Master Test plans	22	26	NA
Bug reports	74	78	NA
Product / Test coverage outlines	24	25	NA
We do not have any testing documentation	4	NA	NA

Not surprisingly, The most prevalent reports type are bug reports, followed by test reports and high-level test plans. Compared to last year we see a decrease in the usage of mind maps, but we need to see if this is a consistent trend.





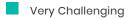




Testing team challenges

How challenging are each of the following aspects of the testing team and their work in your organization.

40							
42	30	28	Keeping up with change drivers (technology and methodologies)		28	40	32
 44	32	24	Team Budget		31	30	39
41	29	30	Time spent on side tasks not related to testing		30	34	36
 41	29	30	Interactions with Developers		20	26	54
39	31	30	Adjusting to work on Agile teams		20	30	50
36	33	31	Work with Offshore / Outsource		22	26	52
 36	36	28					
35	24	41					
	41 41 39	41 29 41 29 39 31 36 33 36 36	41 29 30 41 29 30 39 31 30 36 33 31 36 36 28	Time spent on side tasks not related to testing Interactions with Developers Adjusting to work on Agile teams Work with Offshore / Outsource	1	41 29 30 Time spent on side tasks not related to testing 30 41 29 30 Interactions with Developers 20 39 31 30 Adjusting to work on Agile teams 20 Work with Offshore / Outsource 22	1



Challenging

Not Challenging











Changes to the way we test

As part of our "open questions" we like asking how people are implementing new things in their teams and processes and we got some pretty interesting responses:

- I used to do a lot of scripted/formal testing, this year I am focusing more on Exploratory Testing and it has helped me to discover more bugs.
- Implementation of Test Management tools, and also Performance Testing of the system
- Attempted automation of the regression suite not a huge success so far.
- More risk analysis during design. I have enough experience with our product to be a vital part of the design groups. Risks and potential errors are more often found early, i.e. before implementation.
- I officially implemented automated testing in early 2019 and have seen a 30% decrease in the number of post-release bugs reported when compared to the prior year.
- Hiring Developers to improve code quality of the test codebase seems to be related to test automation or frameworks. It would be interesting to know if there are more testers are doing in such contexts....
- Shifted to agile practices rather than waterfall

- Gave the team training sessions on API and API testing.
- We are shifting from QA being primary tester to Development owning testing, with QA as test advocates and Drivers
- Using test automation and CI/CD to nudge teams towards Agile practices. We are doing this because simply advocating for Agile practices wasn't working. It is too early to tell with certainty what impact this will have.











New Technologies or Subjects in general that will be important to the testing world in 3-5 years from now

Another open question for our respondents to try and understand what topics or areas are going to be "hot" in the coming years. For all those young testers, or people asking themselves what technologies should I be investing my knowledge for the coming years, here are some interesting ideas!



IOT



Machine Learning



Augmented & Virtual Reality



Data **Analytics**



Observability



Neural **Networks**



IAST (Interactive **Application Security** Testing) & RASP (Runtime Application Security Testing)



Ethics Engineering



No Code











Additional non-testing activities

As part of our "open questions" we like asking how people are implementing new things in their teams and processes and we got some pretty interesting responses:



Coaching teams



Production deployments



Monitoring and alerting writing user stories



Onboarding for new team members



Cross-fun ctionalbusiness analysis



Feature development



Managing releases



Developing a CI/CD **Pipeline**



Customer support and demos



Client consultant



UI/UX and **Application** Design



Scrum **MASTER TASKS**



Requirement gathering



Change management



Writing user stories



Programming and fixing bugs in our Applications









PERSONAL DEVELOPMENT











Testing skills and knowledge needed to succeed

	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT
IoT testing (Internet of Things)	36	49	14.
Operations management	36	54	11
Enterprise software and process testing (ERP, CRM, BI, etc)	31	54	15
Machine learning testing / Al	31	51	18
Embedded systems and testing	29	55	15
Business skills	28	54	19
Big data testing	27	55	18
Customer facing skills	21	49	30
Microservices testing	19	55	27
Testing in the Cloud	18	57	25
Data analysis	16	54	30
Programming skills	14	58	29
Mobile technologies and testing	12	54	34
Coaching / Training skills	9	53	38

	NOT IMPORTANT	IMPORTANT	VERY IMPORTANT
Agile methodologies	9	51	39
Security testing	8	44	48
Performance and load testing	7	55	62
Test / Experiment Design	5	49	46
API testing	4	43	54
Test automation patterns, principles, practices	4	45	51
Web technologies and testing	3	42	54
Functional testing automation and scripting	3	35	48
Communication skills	1	20	79
General testing methodologies	1	46	53



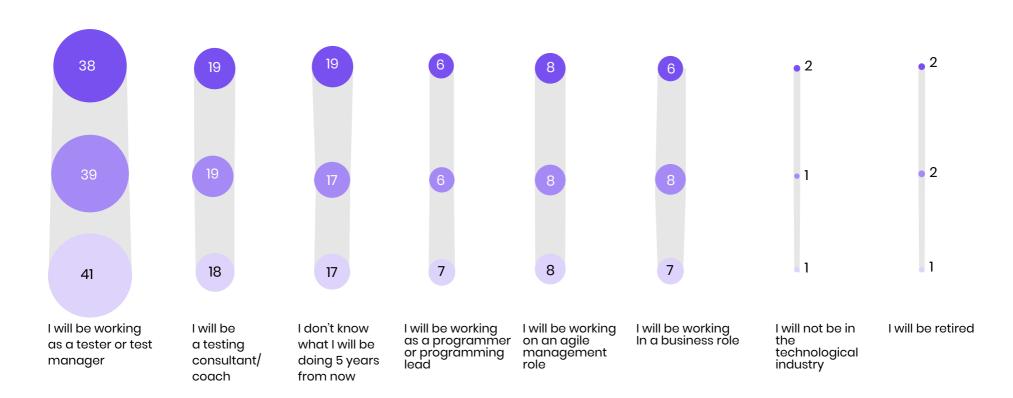






The Future of Testing

Where do you see yourself 5 years from now?







2018



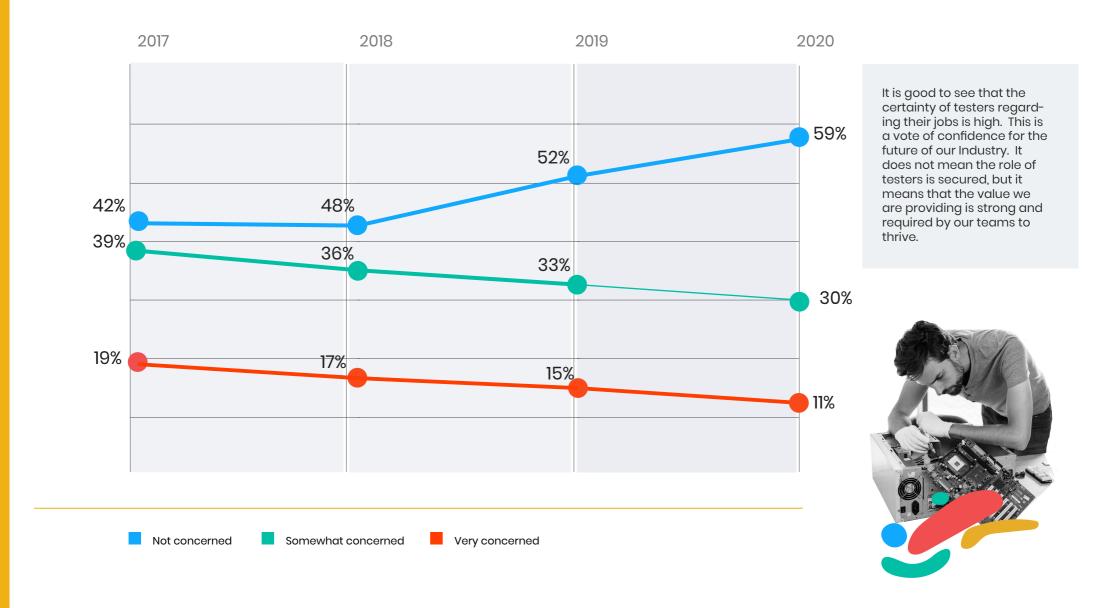








How concerned are you about your job stability











As a tester, what would you like to see changed (regarding people, your organization, the Industry) that would help you do your job better?

What are testers hoping will change or improve

More than 1 tester per team.



Management and SW developers valuing testing more than nowadays







Better understanding of testing and IT as a whole, as well as overall communication.



More buy-in in shift-left principles

More agility, being involved earlier in the SDLC, being more involved in usability decisions and improving the design of the software

We will be more valuable if are seen as test advocates or test consultants for the whole team, rather than being boxed into a narrow role such as "manual tester" or "test automation developer".

Including / Involving QA in the early project stages - Plan sufficient time for the planning & designing stages

More whole team approach



Test automation tools be first class software. or integrated like Unit Tests

I would like to see the 8-months "learn how to become a tester" courses to go away.

> I would like enterprises to understand that not all apps are web and micro-service based. Some apps are thick clients and they require a different approach. Some are security apps which also requires a different approach.

Solution oriented. without spending too much time in politics



Realistic time-frames for projects

39









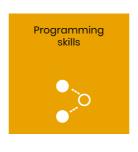
If you are a hiring manager, did you change or add any desired skills in the people you are looking to hire for testing jobs?

What are those skills?











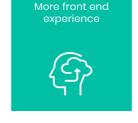






































Final Note

What did we learn from this year's state of testing?

We are sure that each of us will get something different from all the information contained in the report, and as many in our profession remind us constantly, the reason for this is that everything will be based on the context.

We hope the information and the analysis of this report will help you, your colleagues, your teams, and our whole Global Community to continue our path of becoming better testing professionals.

There is no doubt that our profession is evolving as part of the complex process pushing the Software Industry forward. This process is forcing us not only to become more efficient, but also to re-imagine the value of our services, and in this way also to redesign our approach towards generating value for our teams, our companies, and our customers.





To quote from Brent Jensen and Alan Page, and their Modern Testing principles, we are focusing our testing goals in "Accelerating the Achievement of Shippable Quality", and doing this in the broadest sense possible.

Yes, we are still chartered to achieving Quality, but we cannot do this by testing it into the product at the end of the process. Yes, we need to guide the testing operations in our teams, but we cannot do all this testing ourselves. Yes, we need to focus our efforts on user-value, but we need to find a way to involve the users (at least more) in this process too.

To go back to our opening words, the world is undergoing changes. Some of them have been happening for a while. Others are being triggered faster by events affecting our health, our security and even the environment we live in.

Our goal should be to improve the World we live in, one step at a time, moving forward surely towards a better tomorrow, each of us contributing by being better people and better professionals.

Until next year!

Lalit and Joel











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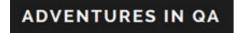
























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