THE STATE OF TESTING™

REPORT 2022

Tea-time with Testers

PractiTest

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Introduction

Welcome to this 9th edition of the Report we started back in 2013.

The motivation behind this project has not changed, we want to help our Testing Community by shedding light on the current practices, challenges and trends taking place in our ecosystem by going directly to you, the testers, and allowing you to participate with your own voices and experience.

One of the most important and interesting aspects of this project is the fact that we have been running it for a number of years, allowing us to get a good perspective of the slow changes and the constant evolution of our practices.

This year we are unveiling a new section, with some specific questions related to the effects Agile and DevOps are having in our testing (in the micro) and in the organizations we work (in the macro).

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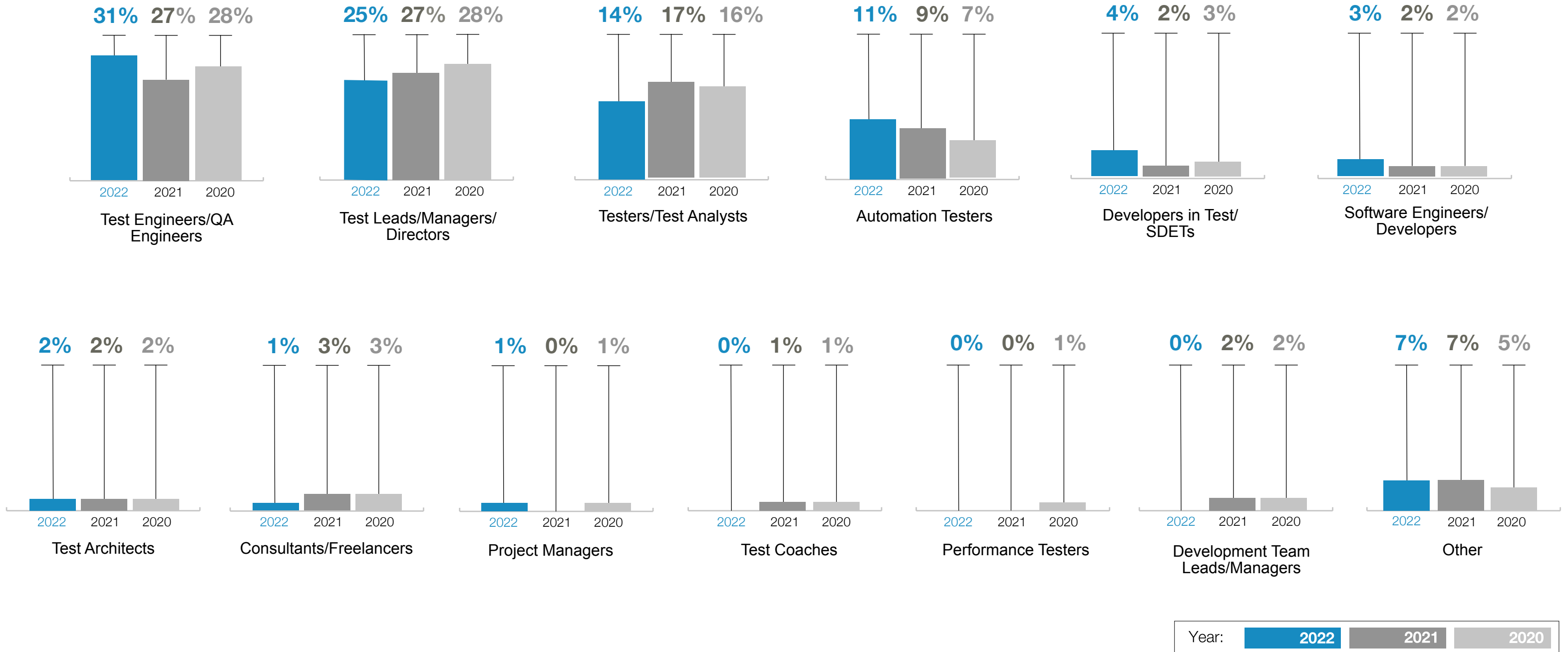
-Joel & Lalit

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Section One

Demographics and Background

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Survey Participant's Titles

Participant's current positions (3 year comparison)

31% 27% 28%
Test Engineers/QA Engineers
2022 2021 2020

25% 27% 28%
Test Leads/Managers/ Directors
2022 2021 2020

14% 17% 16%
Testers/Test Analysts
2022 2021 2020

11% 9% 7%
Automation Testers
2022 2021 2020

4% 2% 3%
Developers in Test/ SDETs
2022 2021 2020

3% 2% 2%
Software Engineers/ Developers
2022 2021 2020

2% 2% 2%
Test Architects
2022 2021 2020

1% 3% 3%
Consultants/Freelancers
2022 2021 2020

1% 0% 1%
Project Managers
2022 2021 2020

0% 1% 1%
Test Coaches
2022 2021 2020

0% 0% 1%
Performance Testers
2022 2021 2020

0% 2% 2%
Development Team Leads/Managers
2022 2021 2020

7% 7% 5%
Other
2022 2021 2020

Year: **2022** 2021 2020

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How Long Have You Been Working in Testing?

... and From Where?

<1 year
- 9%
- 6%
- 5%

1-2 years
- 12%
- 8%
- 7%

2-5 years
- 18%
- 19%
- 24%

5-10 years
- 29%
- 30%
- 27%

10+ years
- 32%
- 37%
- 37%

18% USA & Canada

22% Western Europe

10% Russia & Eastern Europe

9% Asia & Middle East

35% India

2% Africa

3% Latin America

1% Australia & New Zealand

Year: 2022 | 2021 | 2020

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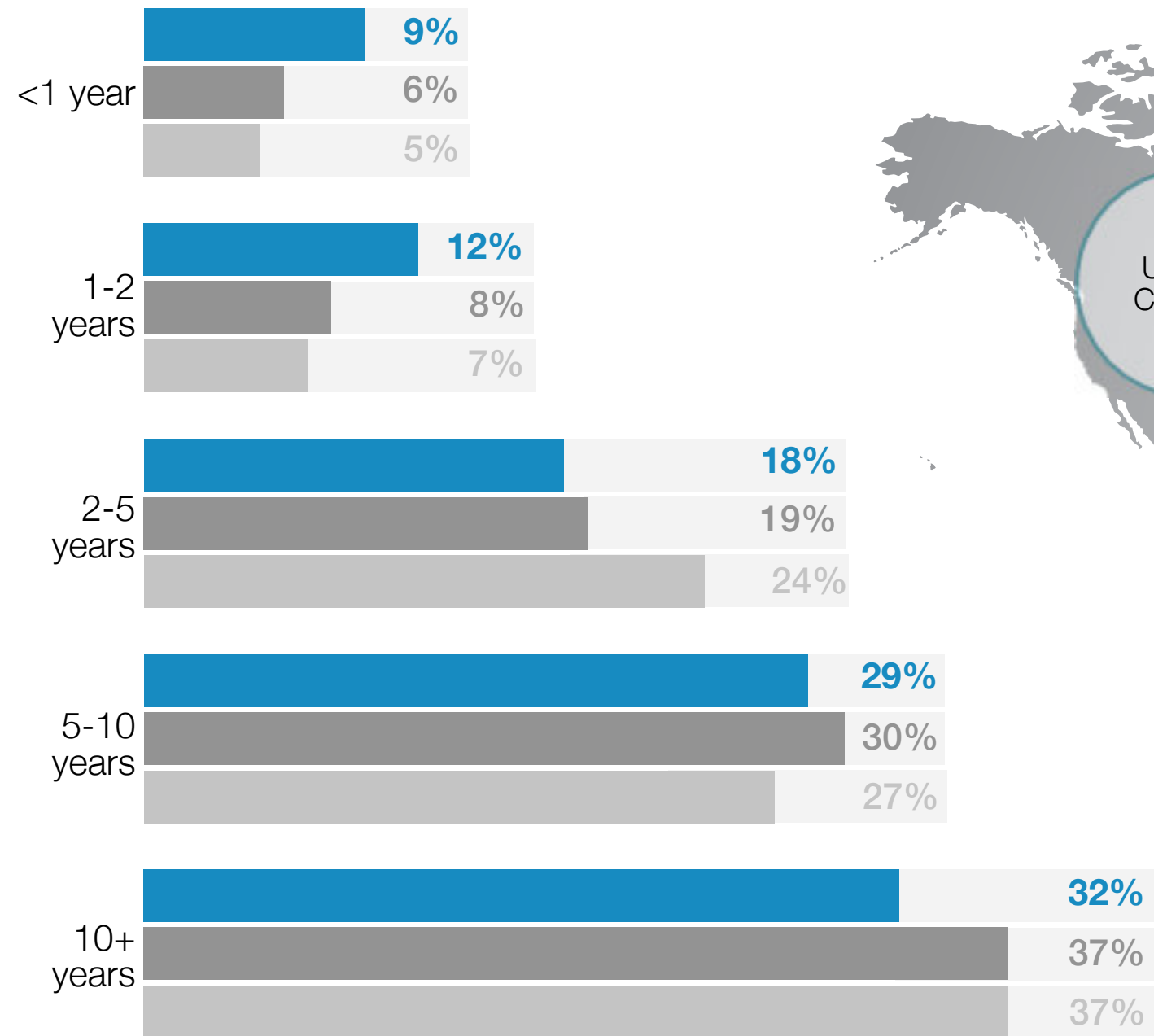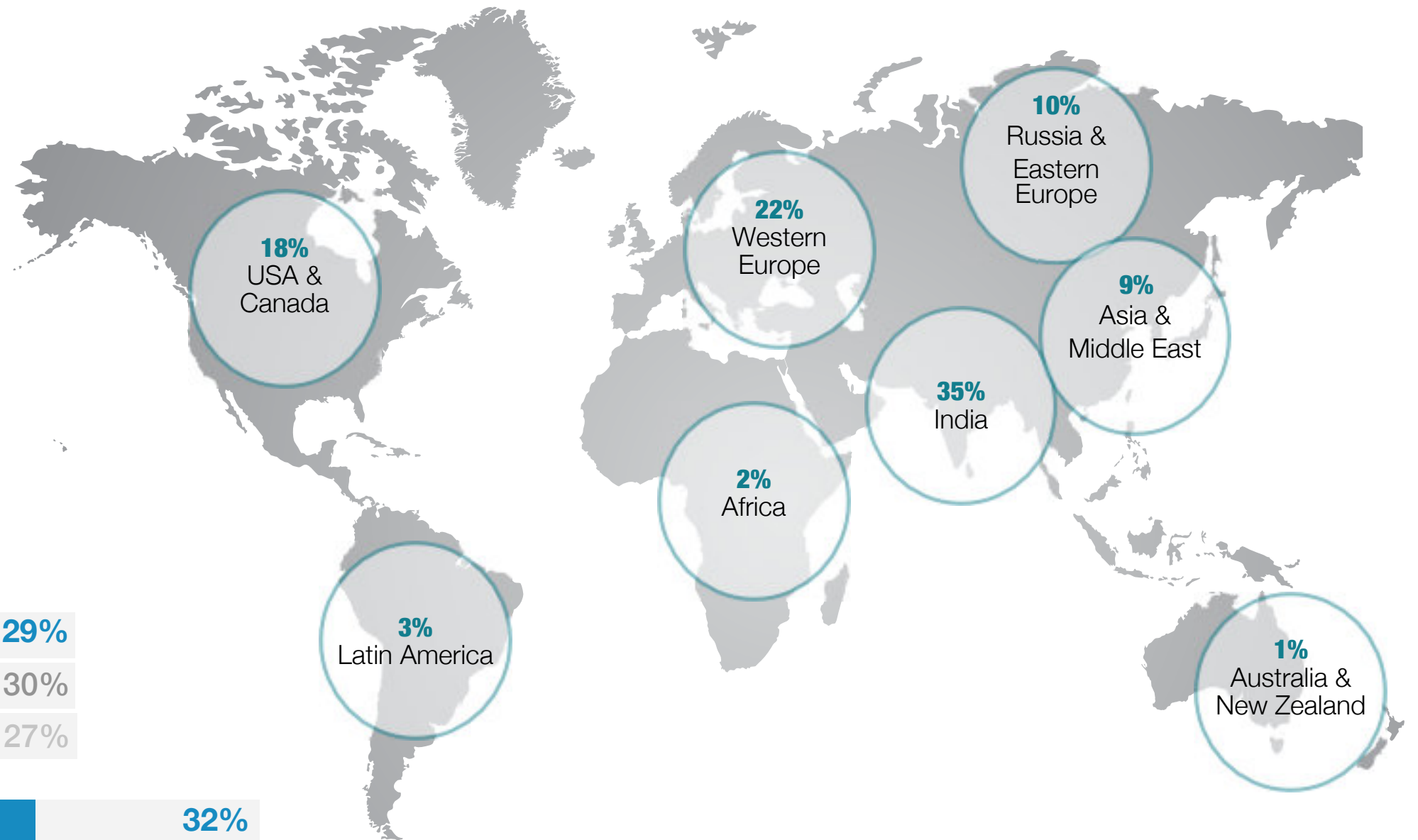
Annual Income

In relation to experience and country of employment

	Less than 1 year	1 -2 years	2 - 5 years	5 - 10 years	10+ years
India	10K	31K	33K	39K	55K
Western Europe	18K	20K	40K	104K	118K
USA & Canada	80K	106K	120K	130K	205K
Russia & Eastern Europe	12K	20K	48K	54K	112K
Asia & Middle East	10K	30K	42K	58K	120K
Latin America	15K	15K	—	65K	—
Africa	—	50K	65K	—	80K
Australia & New Zealand	—	—	—	130K	195K

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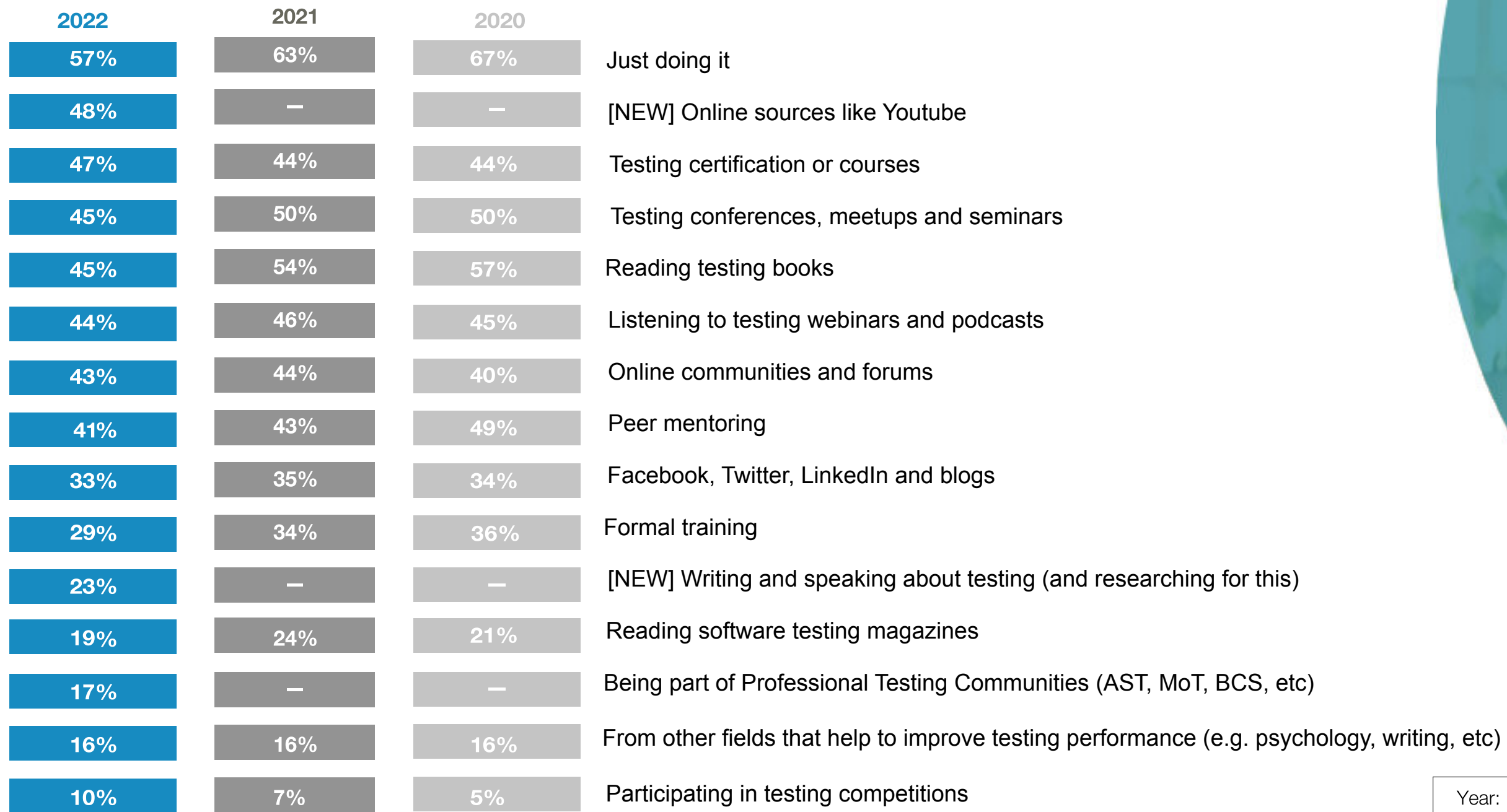PractiTest
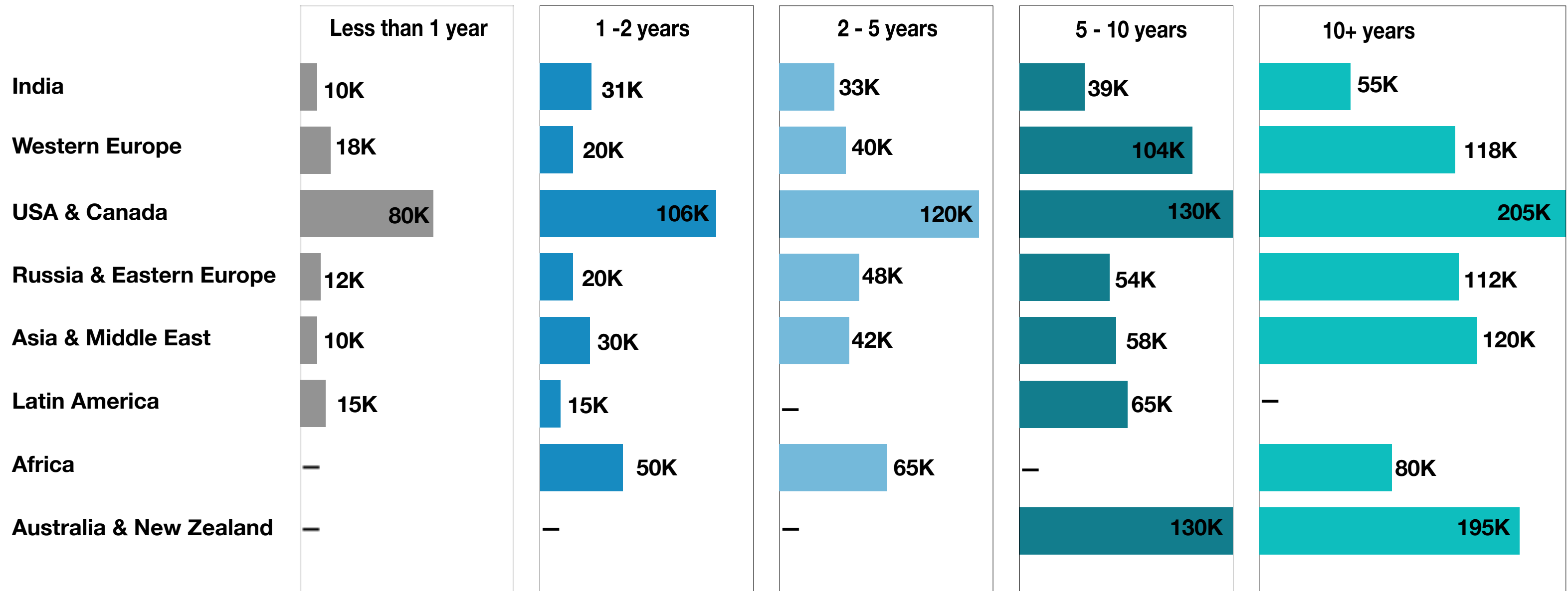
Testing in Your Organization

We can see the number of testers in the teams decreasing this year. This may be pointing towards the trend of testers being distributed within the development teams instead of having large testing teams working independently as separate entities.

8%
8%
8%
I'm the only one

34%
30%
39%
2 -5 Testers

25%
27%
23%
6 - 15 Testers

20%
18%
14%
16 - 50 Testers

12%
13%
14%
51+ Testers

3%
4%
Other

Year: 2022   2021   2020

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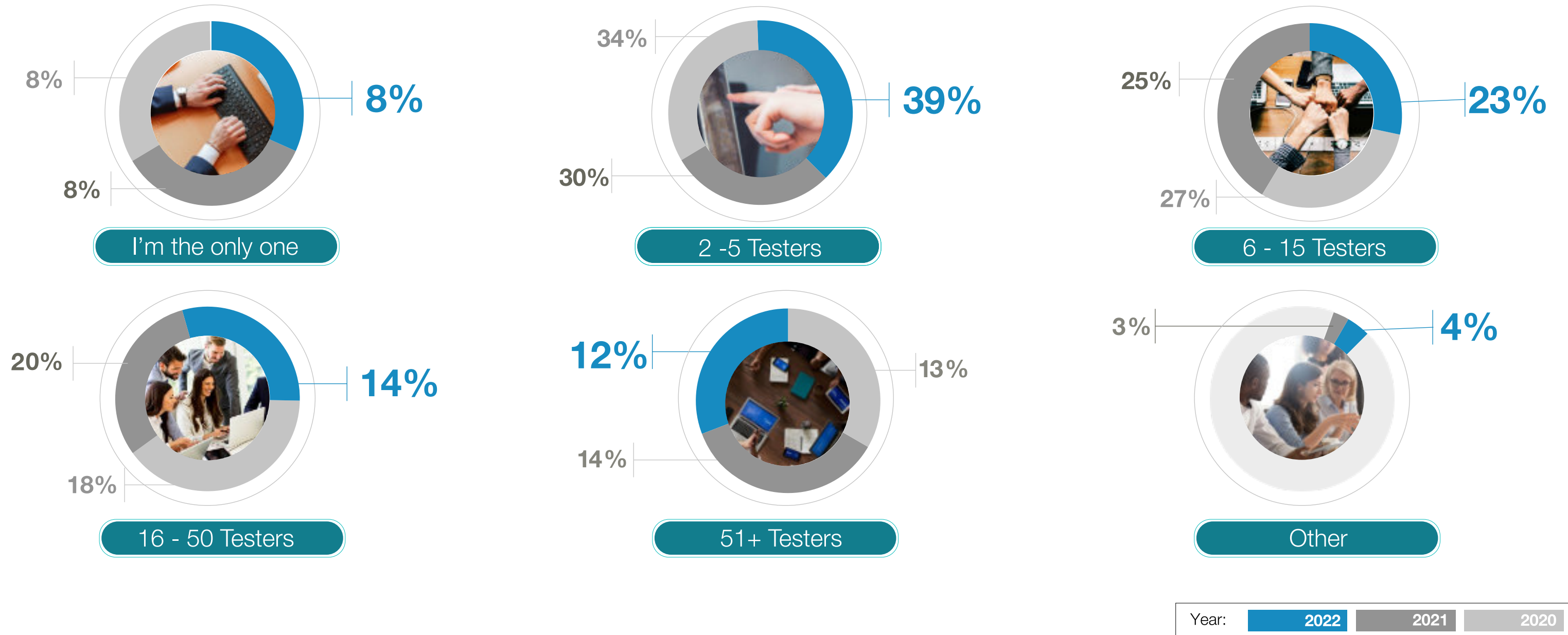
Education and Training - How Do You Learn "Testing"?

Methods used today or have used in the past to enhance your knowledge and sharpen your testing skills.

2022	2021	2020	
57%	63%	67%	Just doing it
48%	–	–	[NEW] Online sources like Youtube
47%	44%	44%	Testing certification or courses
45%	50%	50%	Testing conferences, meetups and seminars
45%	54%	57%	Reading testing books
44%	46%	45%	Listening to testing webinars and podcasts
43%	44%	40%	Online communities and forums
41%	43%	49%	Peer mentoring
33%	35%	34%	Facebook, Twitter, LinkedIn and blogs
29%	34%	36%	Formal training
23%	–	–	[NEW] Writing and speaking about testing (and researching for this)
19%	24%	21%	Reading software testing magazines
17%	–	–	Being part of Professional Testing Communities (AST, MoT, BCS, etc)
16%	16%	16%	From other fields that help to improve testing performance (e.g. psychology, writing, etc)
10%	7%	5%	Participating in testing competitions

We can see that other than a slight increase in the percentage of testers learning from courses and certifications, all the other sources decreased in the last couple of years.

Does this mean that testers have less motivation to increase their knowledge or do they have less time to invest on this task?

It is interesting to see that those who chose to expand their knowledge find a big value in formal sources such as courses and conferences, even during these challenging global pandemic times.

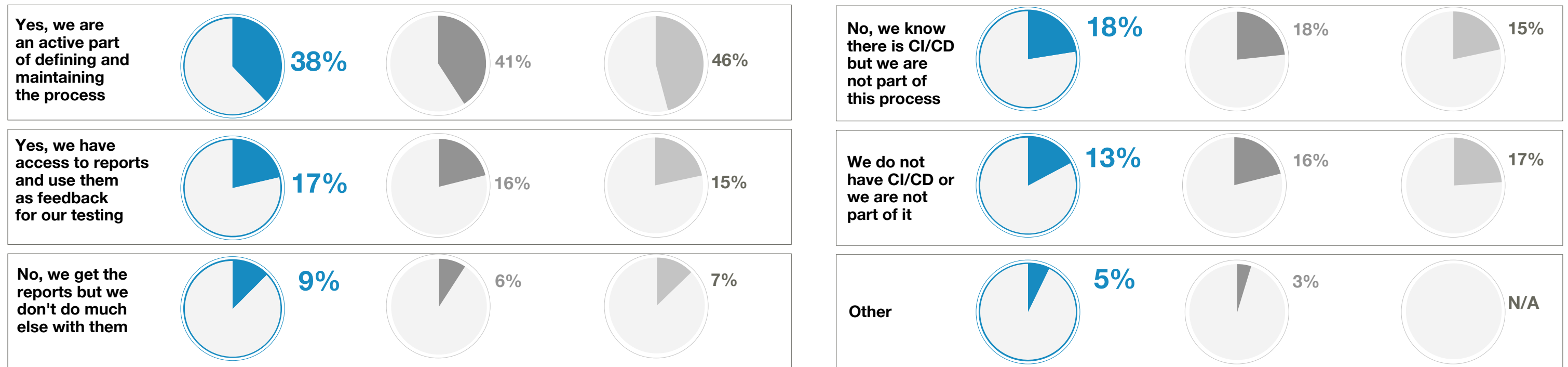Year: 2022 2021 2020

Section Two

Methodologies and Processes

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Do You Work With CI or CD?

(Continuous Integration or Continuous Deployment) in your organization?

42%
Yes, in all or most of the projects

Yes, for some projects only
34%

21%
No we don't

1%
Other

2%
What is CI/CD?

Are testers part of the CI/CD process?

Year: **2022** | 2021 | 2020

	2022	2021	2020
Yes, we are an active part of defining and maintaining the process	**38%**	41%	46%
Yes, we have access to reports and use them as feedback for our testing	**17%**	16%	15%
No, we get the reports but we don't do much else with them	**9%**	6%	7%
No, we know there is CI/CD but we are not part of this process	**18%**	18%	15%
We do not have CI/CD or we are not part of it	**13%**	16%	17%
Other	**5%**	3%	N/A

CI/CD pipelines have become standard in the Industry and they are an essential part of the overall quality process of any development organization. It is interesting and even somewhat worrisome that an important percentage of testers answering the survey are either not aware of their CI/CD pipeline or even if they are aware of it, they are not an active participant in the process.

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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. For example Developers, Product Owners, Support, End Users may take part of this process.
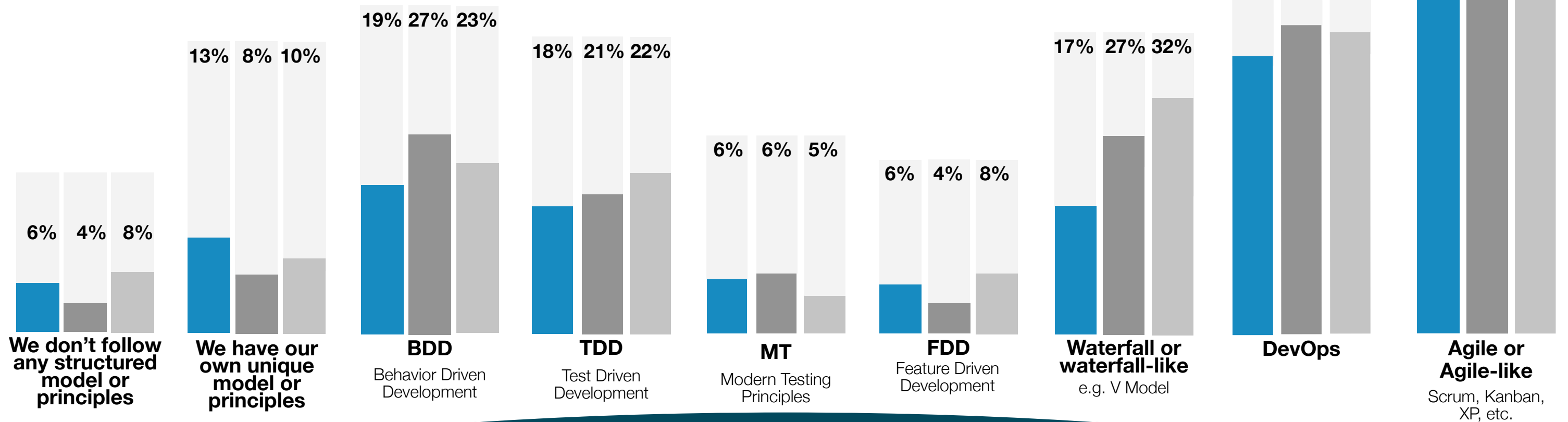
	All the testing is done by dedicated testers only	<10%	10%-50%	50%-75%	All testing is done by non-dedicated testers	Other
2022	18%	34%	36%	7%	4%	1%
2021	15%	43%	29%	11%	2%	N/A
2020	10%	40%	37%	11%	2%	N/A

Year: ▮ 2022 ▮ 2021 ▮ 2020

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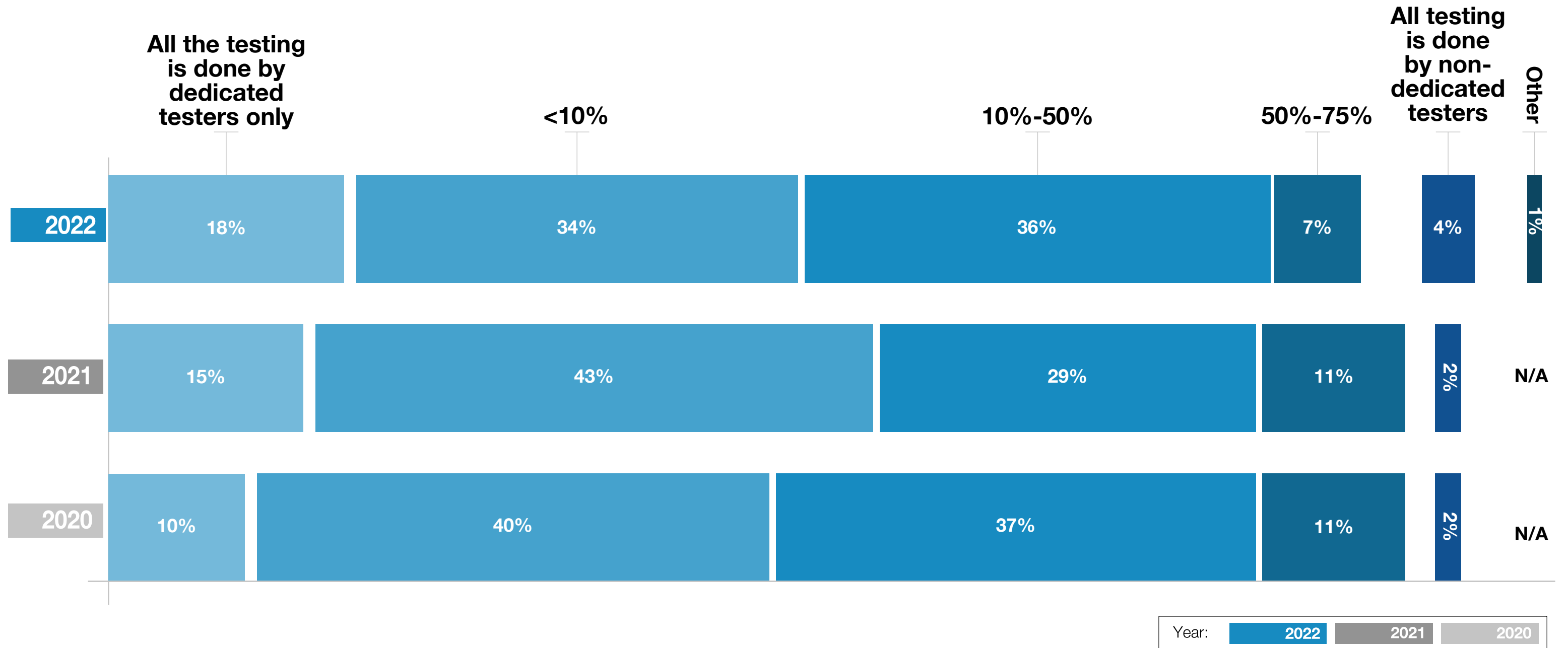
Development and Testing Models or Principles Followed in Your Organization

What type of development models or principles do you follow in your organization?

* More than one option could be selected

Year: **2022** **2021** **2020**

We don't follow any structured model or principles
- 6%
- 4%
- 8%

We have our own unique model or principles
- 13%
- 8%
- 10%

BDD
Behavior Driven Development
- 19%
- 27%
- 23%

TDD
Test Driven Development
- 18%
- 21%
- 22%

MT
Modern Testing Principles
- 6%
- 6%
- 5%

FDD
Feature Driven Development
- 6%
- 4%
- 8%

Waterfall or waterfall-like
e.g. V Model
- 17%
- 27%
- 32%

DevOps
- 38%
- 42%
- 41%

Agile or Agile-like
Scrum, Kanban, XP, etc.
- 86%
- 92%
- 89%

Not surprisingly, Agile and DevOps top the numbers for methodologies used by teams. Also to be expected is the reduction of Waterfall projects, as the legacy products and projects still working under this approach slowly reach their end of life. There is an interesting (maybe also a worrying) jump on the number of testers that either follow no structured model or follow a model of their own with close to 20% of respondents of this year's survey.

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Scripting / Automation

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

* More than one option could be selected

Year: **2022** **2021** **2020**

Category	2022	2021	2020
For Unit Testing	45%	43%	52%
For CI/CD	44%	49%	50%
For Functional or Regression Testing	73%	75%	75%
For Load/Stress Testing	31%	43%	41%
For Test Data Generation	22%	30%	29%
For Log, Alerts and Data Analysis	15%	14%	11%
We Write BDD/Gherkin Scripts Using Tools Like Specflow	17%	20%	17%
For Synthetic and Production Monitoring and Alerts	11%	6%	18%
We Use Home-Built Test Scripts Where Required	17%	17%	19%
I don't Know Where We Have Automation	2%	2%	2%
We Don't Have Automation	14%	11%	12%

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In What Percentage Have Your Manual Testing Efforts Being Reduced as a Result of Introducing More Automation and Scripting?

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

3%	17%	26%	21%	21%	12%
Automation has replaced all our manual testing efforts	Automation has replaced about 75% or more of our previously manual testing efforts	Automation has replaced about 50% of our previously manual testing efforts	Automation has replaced about 25% or less of our previously manual testing efforts	We have automation but it has not replaced any of the manual testing efforts	We do not have automation
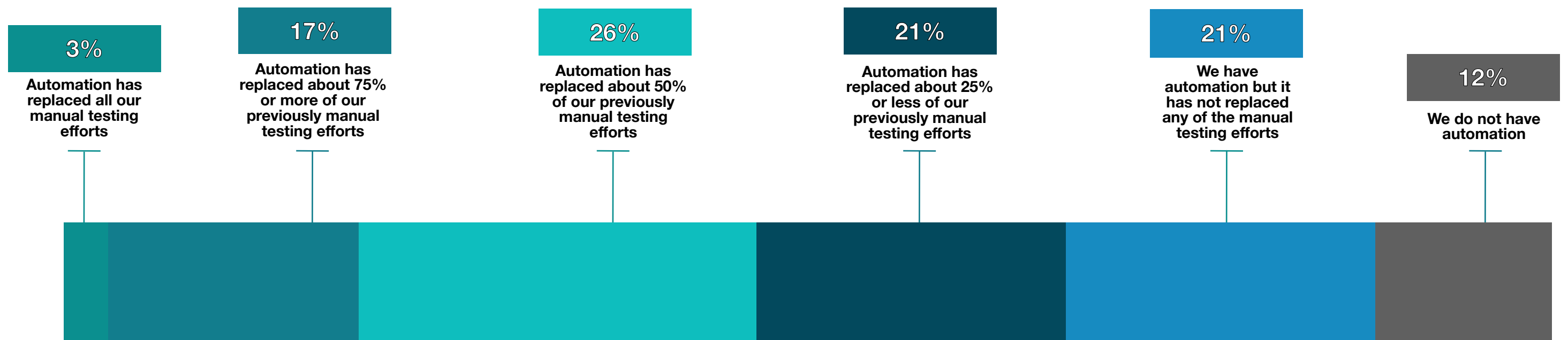
It is very interesting to see that more than 45% of respondents are saying that Test Automation has replaced at least half (or more) of their testing efforts. The evolution and improvement in test automation technologies can be clearly seen on these numbers, but we believe this is not the only factor at play in here as things such as the reduction of testing due to Agile/DevOps practices as well as the shifts left and right should also have contributed to the overall reduction of the number of tests that we are running in what used to be the traditional testing phases of our projects.

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Section Three

The Impacts of Agile & DevOps

This is a new section that we decided to add in order to shed direct light on the effects Agile and DevOps practices are having in our practices. Some of the findings here are very interesting and will surely evolve into additional questions in the surveys we run in years to come.

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What Impact Has Migrating From Waterfall to Iterative Models (Agile and DevOps) Had on the Software Delivery Process?

	Totally Agree				Totally Disagree
	1	**2**	**3**	**4**	**5**
The work of our team is more organized and stable	23%	37%	27%	10%	3%
The team is releasing more features and functionality	34%	32%	21%	9%	4%
The overall level of testing has improved	28%	26%	31%	12%	3%
More non-testers (e.g. Developers, Product, etc) are running tests	15%	21%	31%	20%	13%
We have less serious bugs escaping into production	22%	33%	29%	9%	7%
Collaboration with Developers has improved	35%	31%	22%	9%	3%
Collaboration with the product team, sales team and other customer-facing teams has improved	28%	29%	28%	12%	3%
As a Development Organization, we are providing more value to our Company and Customers	35%	33%	22%	8%	2%

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Estimation of the Development and Testing Tasks

How well do you and your development team estimate the work required for a feature or User Story before you start working on it?
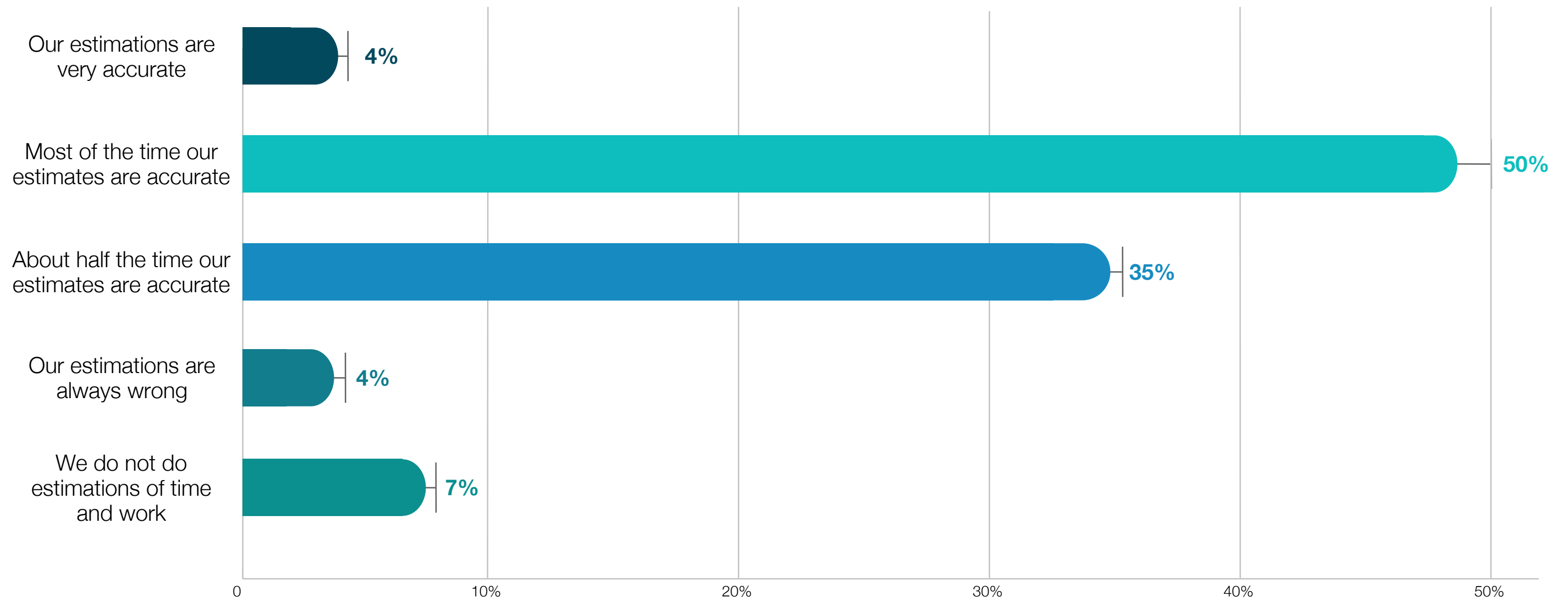
Applied DevOps Practices

	Very Often 1	2	3	4	Never 5
Our team is in charge of developing the product, deploying it to production, and monitoring while in production for issues and general behavior problems	26%	27%	17%	18%	12%
When working on a User Story, we make sure there is the instrumentation that will allow us to monitor it once it is deployed to production	14%	26%	24%	23%	13%
When we decide what to test for a User Story, we define what needs to be tested before deploying into production and what will be tested in production (and how)	29%	24%	21%	13%	13%
As part of the testing process before production, we test the deployment, the migration (when needed), and potential rollback processes in case they will be required	15%	31%	22%	22%	10%
We plan different deployment strategies for our User Stories based on the type of feature and the risks involved in them	19%	21%	25%	22%	13%
During deployment, our team monitors closely the system while assessing the stability of the push to production	22%	30%	24%	14%	10%
Our team has monitoring in place and alerts that are triggered whenever there are issues in production	30%	27%	19%	14%	10%
The testing team or testing members of the team are part of the production monitoring process in order to quickly assess and resolve issues	14%	22%	28%	20%	16%
We use the feedback and metrics from monitoring in production as part of our inputs for planning and developing functionality and tests	17%	26%	23%	18%	16%

It is interesting to see that only about a quarter of the people taking part of the survey have adapted their testing and Quality Assurance process to the challenges and the opportunities provided by DevOps practices. Teams are reviewing and testing their deployments based on the features delivered. And production monitoring is becoming part of User Story analysis. Overall, testing teams are becoming a more active part of the monitoring process, essentially Testing in Production.

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Section Four

Personal Perspective

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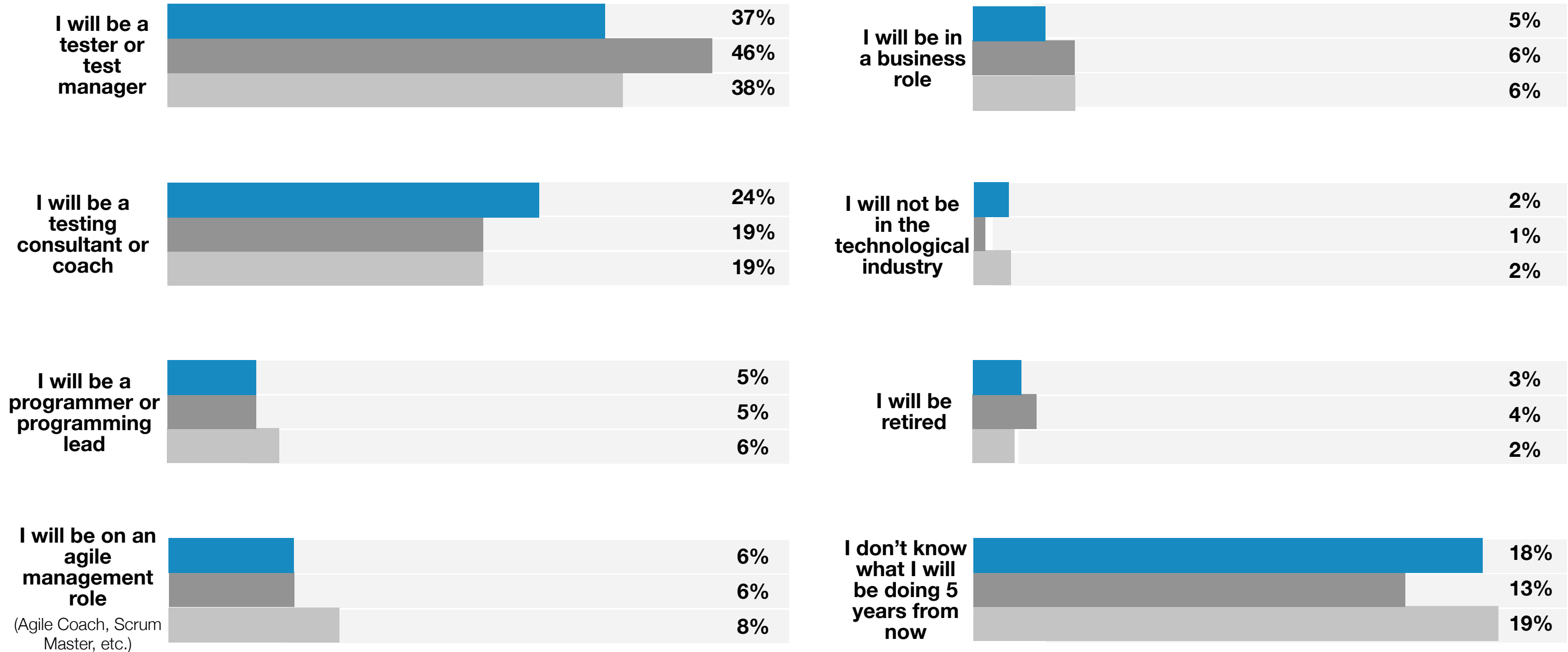
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Testing Skills and Knowledge Needed To Succeed

Shifts in importance of Skills and knowledge-areas needed for testers to thrive today.

	Very Important	Important	Not Important
Agile methodologies	50%	45%	5%
API testing	65%	32%	3%
Big data testing	11%	48%	40%
Business, Marketing, Sales skills	11%	44%	45%
Coaching/Training skills	37%	53%	10%
Communication skills	81%	18%	1%
Customer facing skills	34%	53%	13%
Data analysis	20%	60%	20%
Embedded systems and testing	14%	48%	38%
Enterprise software and process testing (ERP, CRM, BI, etc)	20%	52%	28%
Functional testing automation and scripting	55%	40%	5%
General testing methodologies	62%	38%	1%
IoT testing (Internet of Things)	13%	47%	40%
Machine learning testing/AI	9%	49%	43%
Microservices testing	34%	49%	17%
Mobile technologies and testing	28%	57%	16%
Ops (Operations) skills	13%	61%	27%
Performance and load testing	36%	54%	10%
Programming skills	18%	66%	16%
Security testing	38%	52%	10%
Test/Experiment Design	49%	47%	4%
Test automation patterns, principles, practices	33%	57%	10%
Web technologies and testing	60%	38%	2%

In addition to seeing how communication skills continue being the most important tools for testers, we see other interesting points such as API testing and Test & Experiment design being mentioned as critical for testers. On the other hand it is interesting to see that Ops (Operation) skills are not showing up higher in this table.

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Where Do You See Yourself 5 Years From Now?

When you think about YOUR future 5 years from now... Where do you want to be?

I will be a tester or test manager
- 37%
- 46%
- 38%

I will be in a business role
- 5%
- 6%
- 6%

I will be a testing consultant or coach
- 24%
- 19%
- 19%

I will not be in the technological industry
- 2%
- 1%
- 2%

I will be a programmer or programming lead
- 5%
- 5%
- 6%

I will be retired
- 3%
- 4%
- 2%

I will be on an agile management role (Agile Coach, Scrum Master, etc.)
- 6%
- 6%
- 8%

I don't know what I will be doing 5 years from now
- 18%
- 13%
- 19%

Year: 2022 | 2021 | 2020

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What Desired Skills, Knowledge And Experience Are Hiring Managers Looking For?

*Aggregated from open ended answers

SOFT SKILLS

Total 30%

- Analytical — 4%
- Communication Skills — 9%
- Creative Thinking
- Curiosity
- Entrepreneurial — 7%
- Flexibility
- Positive Attitude
- Self Learner
- Detailed Oriented
- Soft Skills — 10%

TECHNICAL SKILLS

Total 35%

- API — 6%
- Automation — 11%
- Codeless Automation — 3%
- Programming — 10%
- SQL — 1%
- Technical Skills — 4%

TESTING EXPERIENCE

Total 35%

- Agile Experience — 1%
- BDD — 3%
- Cloud Testing — 1%
- DevOps — 4%
- Exploratory Testing — 3%
- Functional Testing — 3%
- Microservices — 4%
- Modern testing Techniques — 1%
- Performance testing — 3%
- Project Management — 4%
- Risk Analysis — 1%
- Security Testing — 3%
- Unit Testing — 1%

Either unfortunately or fortunately, depending how you see it, a tester was and continues to be the equivalent of a Swiss army knife for his or her team. This means that we need to have a combination of skills that will serve our needs depending on the challenge being thrown at us. Just as always, flexibility, critical thinking, and the ability to learn all the time are the most necessary tools any tester needs to have to succeed in our trade.

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

" Earlier access to CI/CD pipelines. "

" I'd like to remove pointless management layers and reporting lines. "

" Testing should be involved already when deciding on architecture or development tools, so that testing point of view (e.g. supportability) would be taken into consideration and also the training of testers could start when adapting new technologies. "

" I would like my organization to actually understand what testers actually do and really care for quality. "

" Getting more information on the end user's day to day usage of the software. "

" Collaborative work culture is very difficult to implement but easy to talk about. I think we need a day to day real-time training on collaborative work and objective based goals. "

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> That automation won't save the industry alone, and that it comes with costs too.

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

> Clearer understanding that testing cannot prevent bugs, that it can only provide information within a particular context which may or may not expose issues before they go to production.

> Realize the vision in modern Testing Principles.

> More collaboration between testers and devs.

> More attention to requirements development and maintenance, and more value to reviews.

> I would love to see that the world understands that testers are not failed programmers, but highly qualified IT professionals with a wide variety of skills and very different competencies.

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

❝ Our organization processes change very slowly and this is impacting our ability to move to an agile, DevOps process. This creates tension with management for our ability to deploy and support our products. ❞

❝ Project leads and scrum master taking tester estimation efforts into sprints. ❞

❝ A better understanding of what automation can deliver and best practices. ❞

❝ Start testing at the requirement stage. ❞

❝ More time spent on the business problem to get the right technical solution. ❞

❝ I would like to see more quality focus shift from testers to developers. ❞

❝ I'd like management to stop seeing automation as a silver bullet solution that guarantees bug free software and replaces testers. ❞

❝ More proper Agile planning and structuring upfront including Architecture decisions, to align with quality aspects. For example making small chunks of stories more test a blearily on rather than leave it to the end of sprint ❞

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Summary

The challenges being faced by testers are shifting as the practices followed by our organizations evolve with time. This is not surprising and definitely not new, but what is surprising is that we continue taking time to adapt to these challenges.

We see how teams keep shrinking with time, as we become part of our Agile teams, and how automation increases as the time for testing is reduced while the technology of the tools goes up. But what we are not seeing is a proactive push by testers to be more actively involved in the quality push of their organizations.

We need to be more involved with quality factors taking place in our production environments, making sure everything we learn while running the software goes back as feedback to our teams for improving our products.

We need to push for quality as early in the process as possible, by being more involved and even taking ownership of the CI pipelines and the testing process taking place on them.

Overall we need to see this challenge as our golden opportunity to provide more value to our organizations.

We call on everyone reading these lines to take upon this challenge and see how 2022 is the year of change, first of all personally, and then as a community of testers and quality professionals.

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PractiTest is an end-to-end test management solution to organize, run and visualize all your QA efforts. it allows you to:

• Incorporate all testing types: manual, exploratory and automation for any testing methodology- Waterfall, Agile or DevOps.

• Connect all aspects of your testing with built-in integrations with the leading bug tracking, automation, and CI/CD tools, for a unified process and improved team communication.

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As the wave of change sweeps the business, testing field and community of testers like never before, Tea-time with Testers has ensured that its readers have all the necessary upgrades to challenge tomorrow. It takes its readers deeper to give a complete understanding of the world of software testing.

Ever since its inception in 2011, it has set one benchmark after another in testing publication circles. It was the first to do serious reporting on software testing theories and thoughts. And then again, it is the first to bring a whole new genre of technical/corporate journalism more up close and more incisive. It is the only monthly magazine in the global testing community known for the quality of its content, authors and unique way of presenting the information.
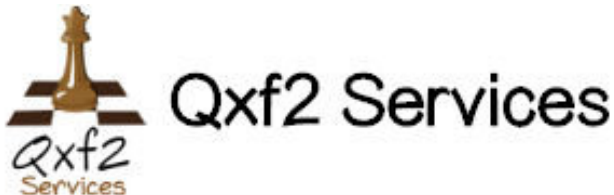
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