

The future of testing

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Intro

How will testing change in the future?

We naturally discuss about software testing daily. Not surprisingly, the future of testing is often a topic of interest and debate.

Since we have an abundance of expertise around this topic at VALA, we thought we'd utilise this and bring our knowledge to a wider audience.

Thus, we made a survey and analysed the results, which was then put together to form this whitepaper.

The main aspect of this whitepaper is the future. While we deal with present too, the main focus is on how various aspects of testing will change in the future.

The survey was answered by 30 software quality assurance experts from VALA.

Enjoy!



Methodology

Respondents

30 software quality assurance experts from VALA.

Questions

- 9 questions all asking how will the importance of topic X change in the future, more accurately, in the next three years.
- Scale 0 to 10; 0 = becomes less important and 10 = becomes more important
- Open comment after each question

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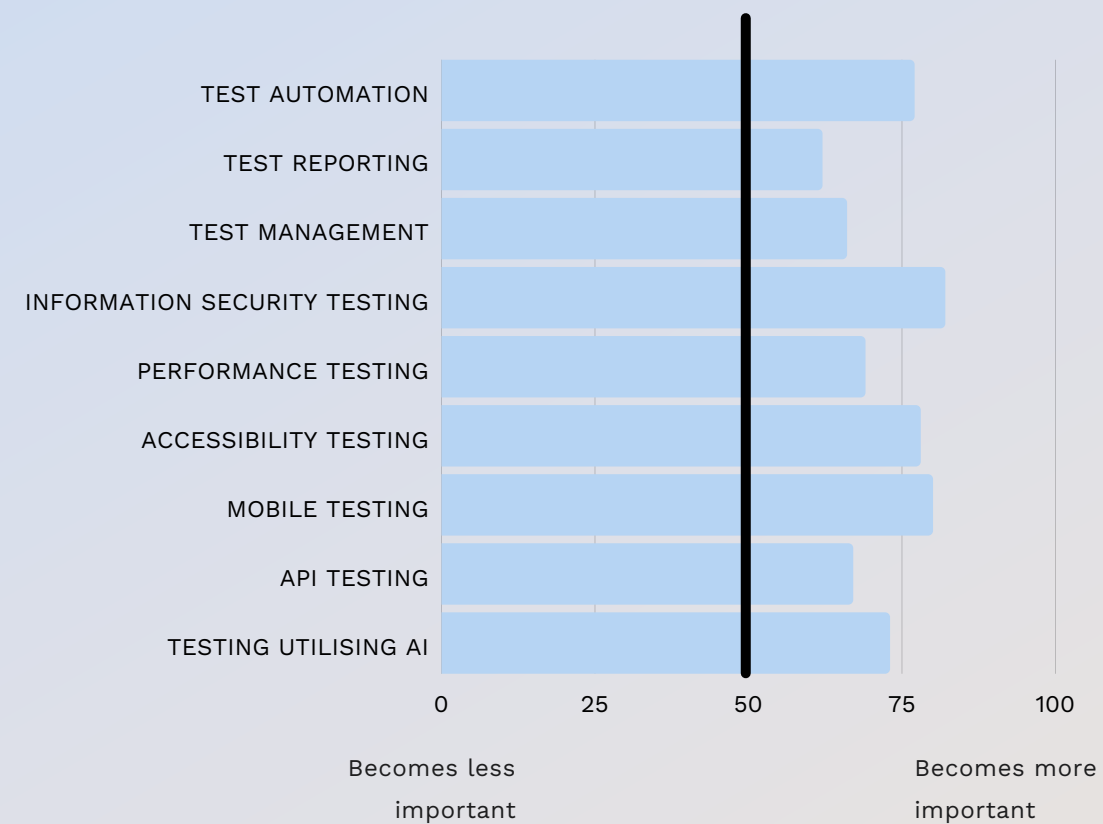
This is by no means a scientific research, although it's an eye-opening summary of how VALA professionals see the future of testing.



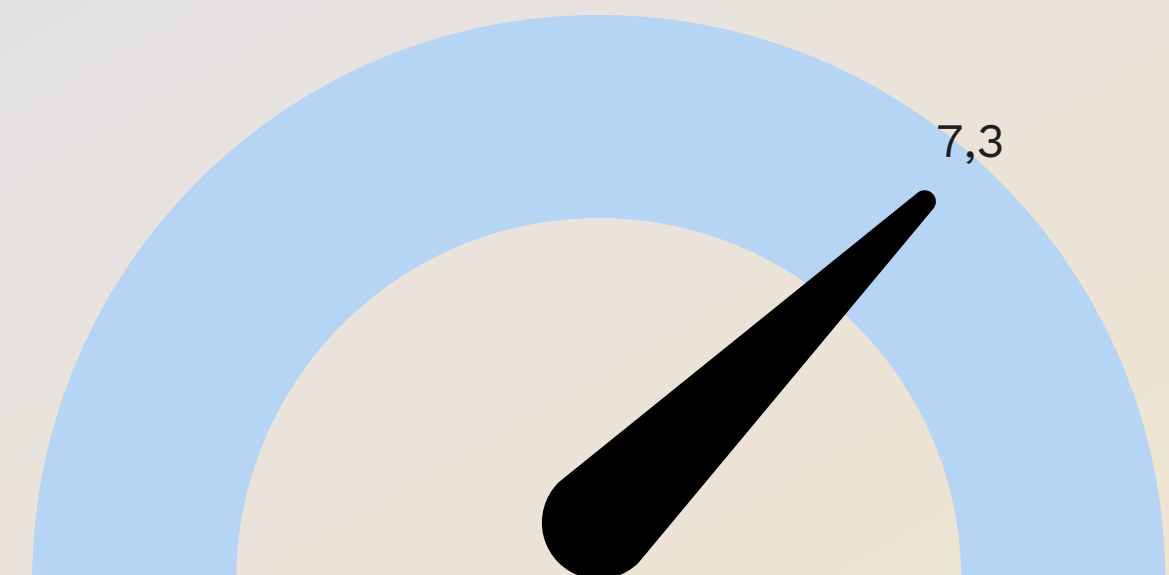
Summary

For all you busy people, here's a summary of this all in one image.

Importance change of all aspects



Importance change in total



2.0

Test

automation

2.1

Test automation

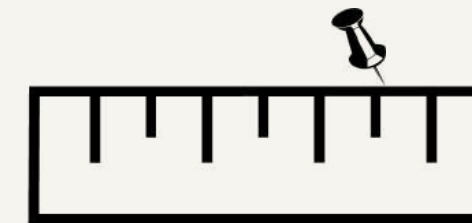
How will its importance change in the future?



Change

Average 7,7

Median 8



→ It will become more important

!!

As TA develops, its value increases all the time. Therefore it will become even more important (although never a complete substitute for exploratory testing).

2.2

Test automation

Why more important?

In general, our respondents believe that test automation will become even more important in the future. Here are the main arguments backing this direction:

"Digital development in general will increase and test automation plays a vital role in it, even more importantly when there's more to be done."

"Complexity of systems is increasing all the time, which will lead to automation having more different forms in the near future."

"More companies are adopting DevOps and test automation is an important part of it."

2.3

Test automation

Why less important?

On average our respondents believe that test automation will become even more important in the future. However, there were some countering opinions highlighting why we shouldn't take this direction as granted:

"There will be a lot of talk about TA. However, the actions to really go there will be lacking. I think the situation remains stagnant."

"I believe it will easily increase for software companies because of their culture and the constant influx of new technologies and approaches. It will be slower for other fields though because I think the advantage of automation is not fully comprehended there yet."

"TA needs to be used not more, but more wisely!"

"Still I believe the majority of testing will be done by manual experienced testers with good business domain understanding. I can see test automation only as supporting tool that is used parallel to free more time for manual/experimental testing."

2.4

Test automation

Summary

According to our experts, it's clear that test automation is currently very important, and most respondents believe the importance will further increase in the future. This was one of the clearest aspects in this survey as no one thought that this importance would decrease.

As test automation technologies, processes and knowhow on their usage develop, the value and importance of test automation increases. There will be more technologies enabling test automation to be used in a wider range of situations. But not only that, test automation technologies will become more efficient and bring more value in today's fast paced software development.

It is to be noted, that test automation never can completely substitute creative human work called exploratory testing and wise quality leadership that improve the software development processes as a whole.

3.0

Test reporting

3.1

Test reporting

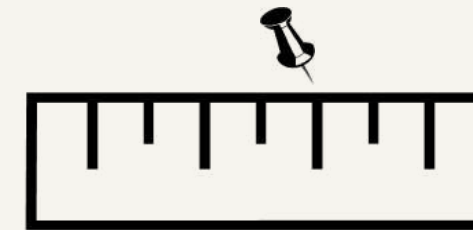
How will its importance
change in the future?



Change

Average 6,2

Median 6



→ It will stay more or less the same

!!

Test reporting is about conveying value & transparency of testing to others; if others aren't convinced about the value of testing, its demand will decrease.

3.2

Test reporting

Why more important?

On average, our respondents believe that test reporting will stay the same or become slightly more important in the future. Here are the main arguments why:

"The demand for high quality reports to support decision making will increase."

"Decision making will become more and more dependent on data, making the quality of data more important."

"More visibility is needed to be able to see more clearly what is happening and what is the current software quality level."

3.3

Test reporting

Why less important?

There were also many opinions justifying how it might not increase or even decrease. Here are some opinions why it would become less important:

"Reporting has been/is/will be equally important. That doesn't change. That's one of the testers' primary functions after all: to share their findings - otherwise those findings are useless."

"Written deep test reports will become less important since agile projects trust more in team communication. Test reports taken from TA tool are more useful."

"Manual test reporting belongs to the past. This part needs to be automated. Results should be traced back with Stories/features and code."

"Not sure if the importance of reporting itself increases, but probably the way of doing reporting might change and the importance of social and presenting skills may increase."

3.4

Test reporting

Summary

So, the average for this was 6,2 and the median 6, and there were many answers in both ends of the scale so clearly this is an opinion divider. Many of the comments were about why its importance would decrease and many of those who thought the importance would increase, didn't leave open comments on why. Why is this?

Presumably the results vary this much because there are different viewpoints to what test reporting means, and what do we compare it to. The amount of manual reporting labor (writing weekly reports etc.) will definitely continue to reduce, but on the other hand there will be more data from automatic test runs, so it is easier to make data driven decisions in the future, so the importance will rise. Also bug reports can be seen as one type of test report, which needs to be of high quality also in the future.

Comparing to the past, the software development release cycle was much slower, so the test reports we're the only way to follow up on the progress. Nowadays the quality and progress of the software development is more evident in the production, so in that sense the test reporting will have less significance in the future.

4.0

Test management

4.1

Test management

How will its importance change in the future?



Change

Average 6,6

Median 7



→ It will become slightly more important

!!

The need for test management is not going anywhere, I believe that we are just transitioning from projects and processes, towards smaller units and eventually everyone will be the test manager of their own work.

4.2

Test management

Why more important?

On average our respondents believe that test management will become slightly more important in the future. Here are the main arguments why:

"There is an increasing need for the combining factor of testing issues as well as someone taking care of the big picture of QA."

"Increasing remote working, new way of doing things (agile, cloud, experimental, 3rd party offshore, nearshore testing) needs more guiding and someone leading individual test professionals. Also, other team members like PO's and service managers require more test management support."

"Test management becomes more important when automation increases and autonomy of the testing increases."

4.3

Test management

Why less important?

The median answer was 7, so more people believed that test management will become more important. However, there were many who thought the importance would decrease, here's a few opinions why:

"Test management (if we think of designing test cases for others, test reporting and status communicating) will become less significant. However, strategic test leadership will become more important in order to make good choices in test strategy and to see the big picture. The teams will handle the traditional test management by themselves among other testing activities, so dedicated test managers will be less important."

"At least the old kind of hierarchical way belongs to the past. Teams should have the ownership and processes should be made in a way that teams are empowered. Of course there needs to be some sort of higher picture in place, but usually as per my knowledge there are too many unnecessary managers."

4.4

Test management

Summary

Though the median answer was 7, when we look deeper to the results, we see that there were also two responses of 2 or lower. So once again this divides opinions as some see the importance definitely increasing, some definitely decreasing.

Based on the open comments the varying opinions are again related to terminology and how things are perceived. For example, one respondent answered 2 as he or she sees the importance of test management decreasing but strategic test leadership increasing.

So, all in all, traditional test management may be less significant in the future, But driving the quality improvements and seeing the big picture is going to be more important in the future. Test management will slowly transform into quality assurance leadership with a wider perspective on the whole software development, using for example DevOps and process automation to improve the development process instead of only looking into the testing efforts.

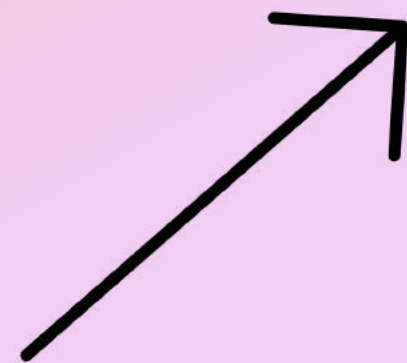
5.0

Information security testing

5.1

Information security testing

How will its importance change in the future?



Change

Average 8,2

Median 8



→ It will become more important

!!

Nobody wants to find themselves from the news. Regulations will only increase. GDPR was just a starting point.

5.2

Information security testing

Why more important?

In general, our respondents believe that this will become more important in the future. Here are the main opinions why:

"Media reporting about data leaks, especially user data leaks, will affect to this."

"Maybe a slight increase as even more data is stored online in hackable/vulnerable services."

"I don't understand why this is not a top priority already! Security issues can lead to serious damage to any business where the software has access to internet (so basically all!)."

"Increasing demand for information security by legislation as well as overall increase of common knowledge in this area."

"I believe in many companies the information security has not been considered as high priority as it should have been and the importance will only increase."

5.3

Information security testing

Why less important?

VALA people firmly believe that information security testing will become even more important in the future. Not a single respondent thought that its importance would decrease. Only one person thought that the importance would stay the same:

"Overall, I don't think the importance changes - it's very very important already."

5.4

Information security testing

Summary

This one is clear, average 8,2 and median 8.

There has been many security breaches which have caused bad publicity to companies with devastating results to the business and the customers. There fore it is quite clear that information security testing needs more emphasis and will be more important part of testing to take into account early on in the software development life-cycle to keep software user's money and personal information safe.

This leads to increase of both penetration testing where some resourceful hackers try to hacking into a system, and security scanning where the typical security vulnerabilities are being scanned or tested by other means. The first requires a highly specific expertise, but the latter is something that all quality assurance professionals could take up in their toolbox.

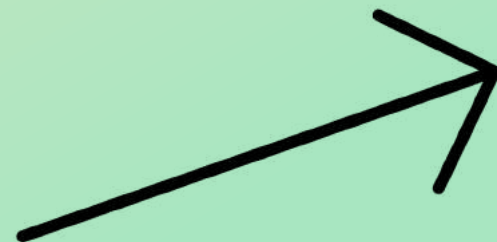
6.0

API testing

6.1

API testing

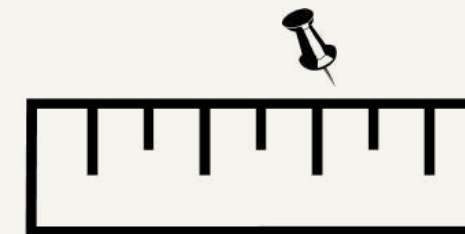
How will its importance
change in the future?



Change

Average 6,7

Median 7



→ It will become slightly more important

!!

Trend seems to be to tear down monoliths. In future there will be more and more APIs and not only REST but more varied kind of APIs. IoT is also one big thing to keep in mind.

6.2

API testing

Why more important?

In general, our respondents believe that this will become slightly more important in the future. Here are the main reasons why:

"I believe API testing will increase without a doubt, especially with the introduction of new approaches on how to generate them (GraphQL being one of them)."

"It is so effective when comparing to functional testing via UI, so it should be utilized more! And luckily more and more high quality software have well structured APIs with good API descriptions."

"Systems discuss more and more between other systems through the API's. We need to have trust that the API's work as expected before we integrate our systems to outside systems. Probably also on security level."

6.3

API testing

Why less important?

The respondents believe API testing will become slightly more important in the future. There was one person uncertain about the topic but concluded the importance would decrease in the future:

"I would have to look into it more but I haven't heard a big demand for this."

6.4

API testing

Summary

Though the average was "only" 6,7, this was still somewhat unanimous topic as only one answer referred to decreasing importance.

API testing is a good way of shifting testing to left, meaning that testing can be done earlier in the development process with API testing, for example before the user interface is ready to use. API testing is also often faster when comparing to UI testing, so it is very usable in test automation in gaining fast feedback. It is a powerful way of getting functional testing, integration testing, security testing and performance testing done with way smaller effort than before.

It seems, that not all testers yet have come across with API testing, so building awareness around this topic is important. With that awareness, when we get in terms with a system under test that has Application Programming Interfaces instead of one big functional monolith software, API testing comes in handy!

7.0

Performance testing

7.1

Performance testing

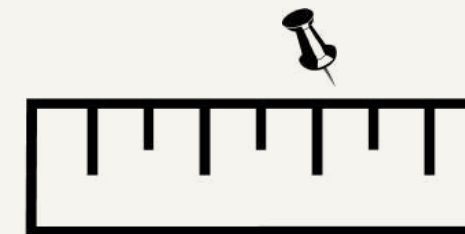
How will its importance change in the future?



Change

Average 6,9

Median 7



→ It will become slightly more important

!!

This is more of a wish than what I actually think will happen. Plenty of fresh new services choke when taken into use. I HOPE that will be remedied in the future but I'm not going to hold my breath.

7.2

Performance testing

Why more important?

On average, our respondents believe that performance testing will become more important in the future. Here are the main arguments why:

"As companies' IT maturity develops, more will take into consideration more specific testing areas."

"There's always a need for that. Customers failing with performance in late phase have learned how it would be better to test performance before final product launch."

"More performance means more users, which usually translates to more money."

"Big data + scalability, it's the main concern and it needs to be performant. I'm guessing we will see a steep increase in interest in performance testing."

7.3

Performance testing

Why less important?

In general, our respondents believe that performance testing will become more important in the future. Here's a few arguments why the importance would stay the same or decrease.

"Quite a lot cloud solutions allow to avoid performance problems."

"Still important on some level but modern cloud infras scale OOB and doing old fashioned performance testing will just cost money."

7.4

Performance testing

Summary

Though the average was "only" 6,9, this was still somewhat unanimous topic as no one thought the importance would decrease.

Even though the increasing use of cloud services prevent software from running out of resources, performance testing is still going to be a vital part of testing also in the future. Optimising resource utilization is also a matter of sustainability - for example minimizing the amount of network traffic can have a significant impact in reducing emissions.

There are still high requirements for time efficiency (processing time and throughput time) which needs to be covered early enough with performance testing also in the future.

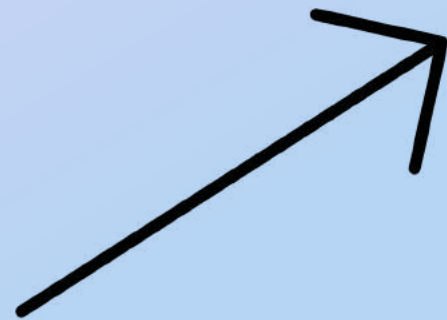
8.0

Accessibility testing

8.1

Accessibility testing

How will its importance change in the future?



Change

Average 7,8

Median 8



→ It will become more important

!!

This has not been a huge testing branch before, but now due to new legislation on accessibility, the service providers can't skip it anymore. It needs to be done properly and through this it becomes more important. Many web services are so essential for everyday life, that they need to be usable by all, despite our disabilities.

8.2

Accessibility testing

Why more important?

On average, our respondents believe that this will become more important in the future. Here are the main arguments why:

"Legislation is pushing this and public sectors/services are already forced to adapt quickly, a big keyword today for private services as well."

"Accessibility is also under pressure due to increasing volume of users e.g. in applications."

"It's like every swimming hall needs to have accessible toilets etc. Same will happen more and more for digital world. Many companies interact with their customers nowadays only via digital platforms, so it is only natural to focus on this to not lose customers (or gain bad reputation). At the same time the tools are evolving rapidly in this area, which makes development and testing easier."

8.3

Accessibility testing

Why less important?

VALA people firmly believe that accessibility testing will become more important in the future. Not a single respondent thought that its importance would decrease. Only two people thought that the importance would stay the same:

"This part tends to be automated during development, and also it has low business value."

"Often does not pay back in business. Perhaps, in some aspects this is important, but hard to believe it would become more important."

8.4

Accessibility testing

Summary

VALA people are pretty much unanimous on this topic as no one thought the importance would decrease. Moreover, there were more number ten replies (20%) than in any other topic.

Accessibility testing is already a legally obligating quality aspect, essential services need to be accessible to all, in spite of disabilities such as permanent visual imparity (for example color blindness or blind person using reading devices) or temporary disability like a baby in the users' arms. Therefore, accessibility testing is now more important than ever before.

As the vital services are more and more provided solely via online interfaces and highly automated without a possibility for human interaction, the more important it is to take care of accessibility of the services.

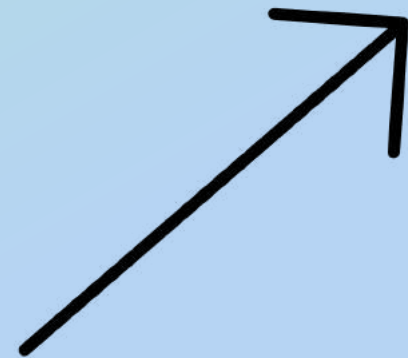
9.0

Mobile testing

9.1

Mobile testing

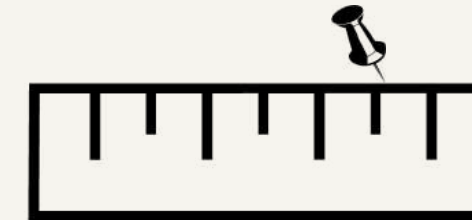
How will its importance
change in the future?



Change

Average 8,0

Median 8



→ It will become more important

!!

All customers in almost all business areas are making apps to support mobility.

9.2

Mobile testing

Why more important?

On average our respondents believe that mobile testing will become even more important in the future. Here are the main arguments why:

"More and more users want to use their mobile devices to use digital services, from where they are. It's becoming obsolete to think that users sit at home by they computer, when using digital services."

"There will be more and more actions done via mobile. For example, I would not shop in a web store that doesn't work in mobile. (More people have mobile devices than access to a toilet in the world!)."

"Increasingly we live in a mobile first world."

"All customers in almost all business area are making apps to support mobility."

9.3

Mobile testing

Why less important?

In general, our respondents believe that mobile testing will become even more important in the future. However, there were some countering arguments too:

"Not seeing that it will get any more important as it is already very critical in successful projects. Other discussion is that are apps here to stay or are we moving more and more towards some PWA kind of way. Of course big companies like Apple fight against this but everything changes eventually (not maybe in 3 years). As a developer it is bit of a waste to code same product multiple times for different platforms."

"It will remain as important as it is now. I believe that the saturation point has been achieved already."

9.4

Mobile testing

Summary

The respondents felt unanimously that the importance of mobile testing would increase, if it was not seen that it is highest possible already.

Software is being developed to support a growing number of devices, no matter if it is a mobile application, a mobile web page or a Progressive Web Application, it still needs to be tested.

Testing and especially test automation on multitude of mobile devices is currently quite complicated, so hopefully there'll be new and smart solutions to be used in testing in the future!

10.0

Testing utilizing AI

10.1

Testing

utilizing AI

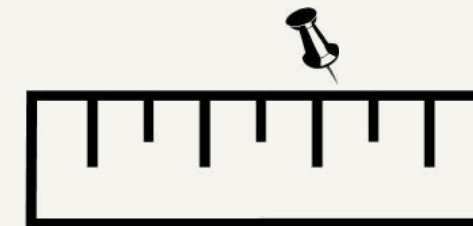
How will its importance
change in the future?



Change

Average 7,3

Median 7



→ It will become slightly more important

!!

Waiting for the revolution.

10.2

Testing utilizing AI

Why more important?

On average our respondents believe that testing utilising AI will become even more important in the future. Here are the main arguments why:

"There is no way around it; AI/ML is coming."

"AI is the direction to which looks like everything is mowing forward to, so yes, I strongly believe in an increase."

"AI becomes de facto at some point in many areas."

10.3

Testing utilizing AI

Why less important?

On average our respondents believe that testing utilising AI will become more important in the future. Once again however, there were some opposite opinions like these:

"Maybe we will more likely start using some other word for it because most probably we will not have actual AI in use for a while."

"Hype. Doesn't produce real business benefits in the coming three years."

"I think in 3 years there's not going to be much of a change in this, maybe in 5 years?"

10.4

Testing utilizing AI

Summary

The median is usually a good figure in cases where there's a lot of variance. Like with this one where 20% responded 10 and at the same time there were also two people who "gave this a 3". The median of 7 here doesn't lie however, testing utilizing AI seems it's becoming more important in VALA People's point of view.

Artificial Intelligence is currently mostly referring to machine learning and computer vision, which are both in the trough of disillusionment in the hype curve, meaning the high hopes are now facing reality, and eventually may lead into usable solutions.

In near future the AI is probably somewhat in use as a part of some testing tools, but probably in a smaller way than expected earlier; it can help the testers make better, data-based decisions. It will certainly not make testing profession obsolete, it's just another tool in the testers' arsenal!

11.0

Summary

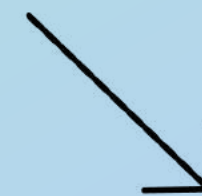
The aspects with highest scores, i.e. the ones that the respondents believe will increase their importance the most are:

Test automation
information security testing
Accessibility testing, and
Mobile testing



On the other hand, the aspects the respondents saw as ones increasing their importance the least were:

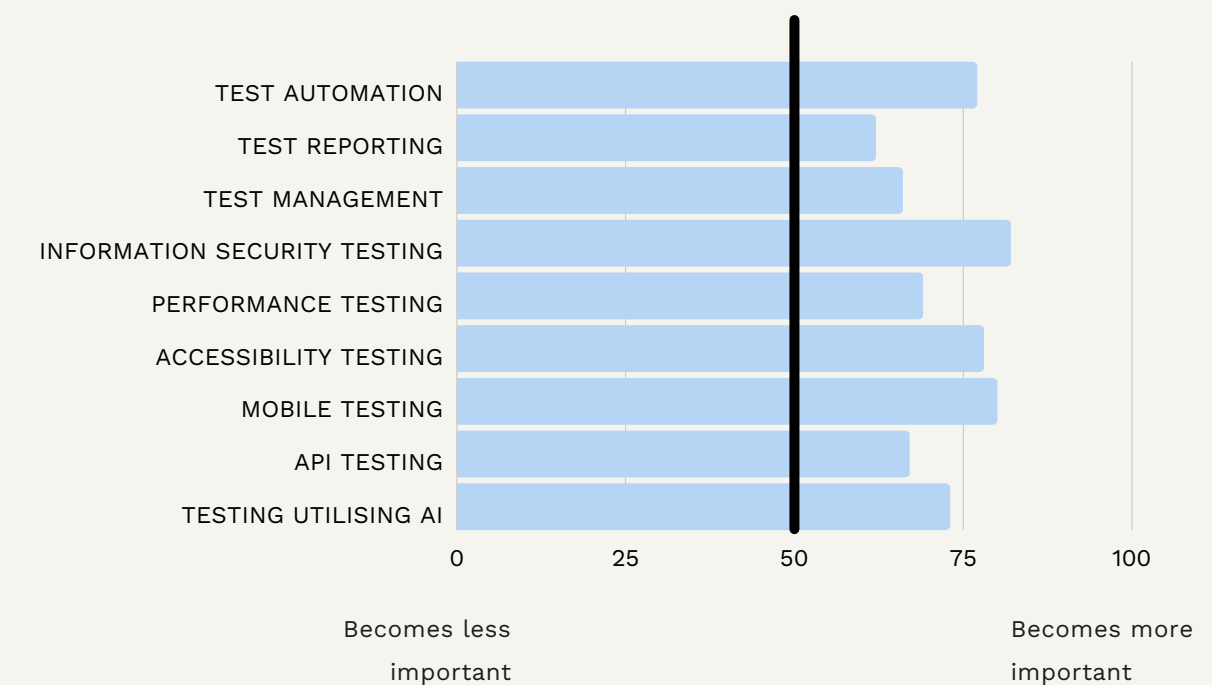
Test reporting
API testing, and
Test management



Importance change in total



Importance change of all aspects



12.0

Conclusion

According to this survey, our respondents believe that the general importance of software testing will increase in the near future (1 to 3 years). This is based on the fact that all of our topics got an average score of above 5 and also the overall average from all topics was 7,3.

Naturally, we have to take into account that the respondent group can be a bit biased because working with these topics daily might make them feel more important. On the other hand, test and QA professionals working in testing every day gives a good gut feeling on what the future holds.

All in all, as the need for high-quality software is business critical in today's businesses, we can say with confidence that testing and taking quality into consideration in all phases of software development will continue its rise in importance. How and by whom the testing is done is always evolving, but the need for quality will definitely not go anywhere!

VALA

Analysis and text by Leena Saari