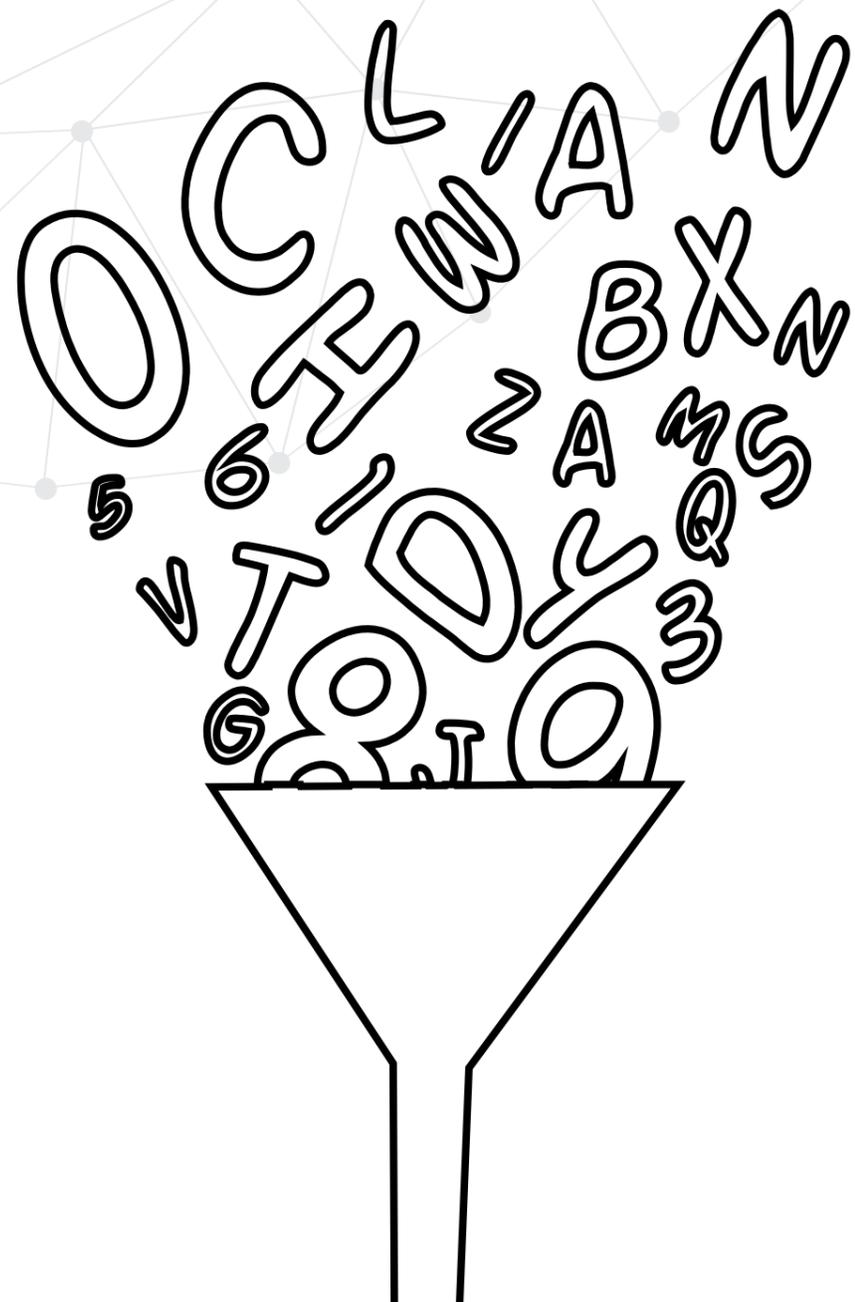


TURKEY SOFTWARE QUALITY REPORT

2015 - 2016

“Business Driven
Performance Testing”



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FOREWORD

Turkish Testing Board [TTB - turkishtestingboard.org] is pleased to bring you the 2015-2016 edition of the Turkey Software Quality Report [TSQR]. TSQR 2015's focus is on performance testing. Apart from traditional testing surveys which solely focus on the technical side of testing, we have tried to put emphasis on the business side of testing. You will find tips and trends in the areas of business requirements, test scenarios, test environment and especially the trending topic; cloud services.

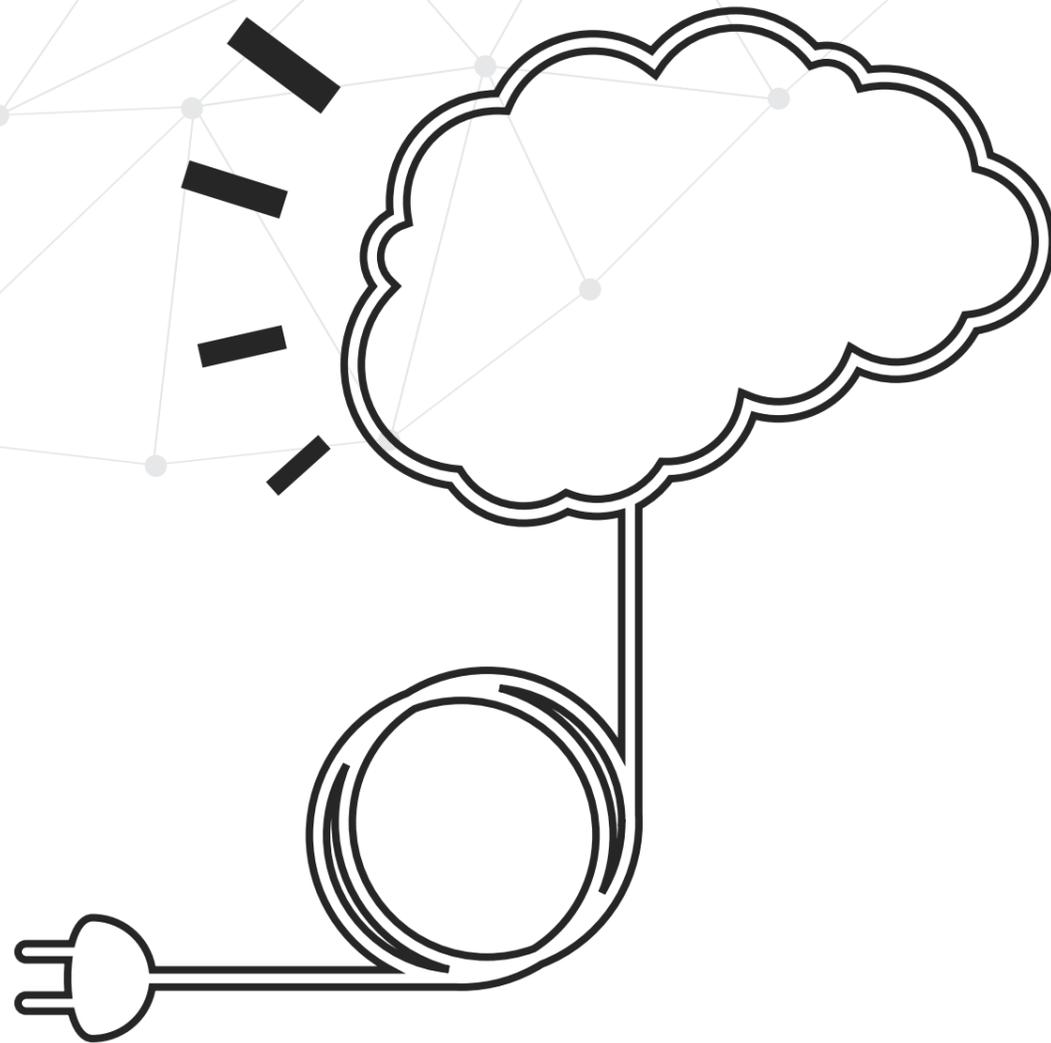
The report is designed to help companies to make paradigm shifts in their mindsets. It not only draws a clear picture of the current situation in the Turkish market but also sets the de-facto standards and trends for future information technology [IT] projects. We hope this report will be a reference point for all decision makers.

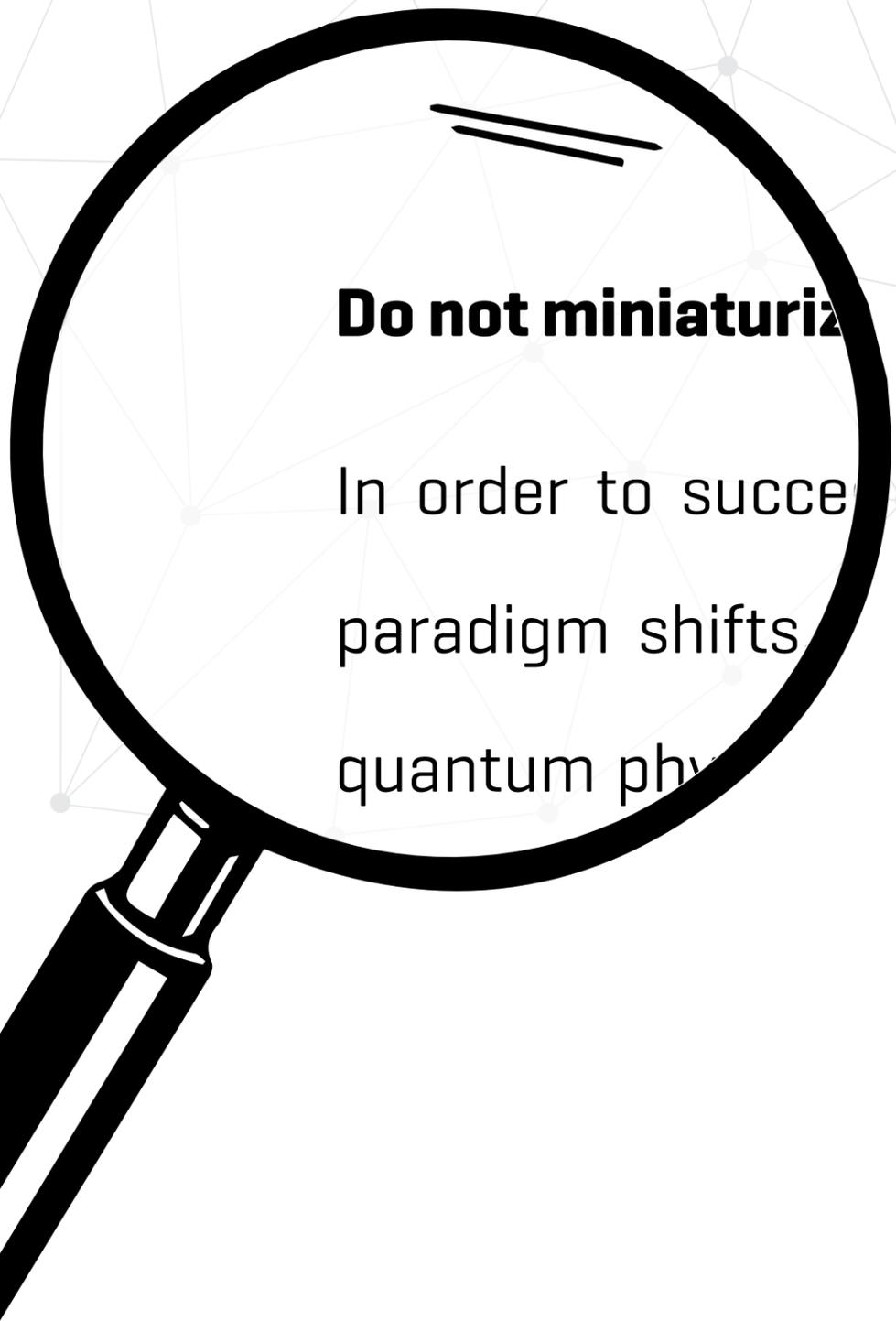
With the help of TSQR, we are trying to lay down the foundations of a healthy discussion platform for improvement in Turkish IT market. TSQR will be presented at the opening ceremony speech of TestIstanbul 2015 [testistanbul.org] on March 27th initiating a series of keynotes, presentations and discussions.

We would like to thank all TTB members and professionals who has taken their time to complete the survey and contribute to this report.

We are looking forward to meeting with you at TestIstanbul 2015 with this year's motto of 'Performance Testing: High Performance Software Driven by Business' on March 27th and discuss the findings of this report face to face.

Turkish Testing Board





Do not miniaturize

In order to succeed

paradigm shifts

quantum physics

EXECUTIVE SUMMARY

Do we really need performance testing?

Whether you are programming on AS/400 platform with Cobol or iOS platform with Swift, your legacy system and your mobile application needs a performance improvement. Because performance improvement means a better user experience, it means less investment in your hardware and definitely will increase the reliability of your systems. The respondents' answers to Question 6 of the Turkey Software Quality Report [TSQR] is also showing the same result; when we asked participants 'How long have you been carrying out performance testing in your organization?', 86,8% of them said that they are carrying out performance testing, even 10,2% said that they are testing their performance for more than 5 years.

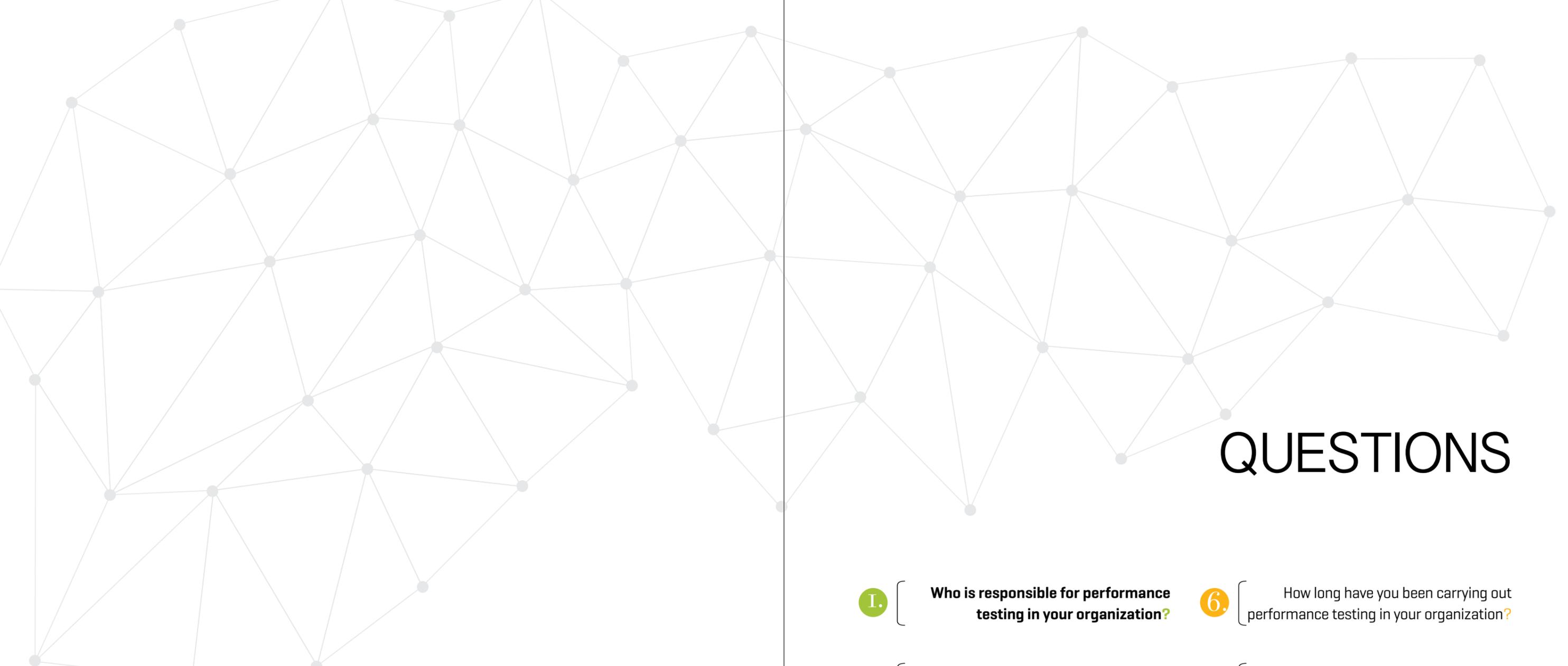
Waiving the first question which is 'Do we really need performance testing?', now comes the next question of 'how much performance testing?'. A wiseman said that it depends. It depends on what? It depends on the risk of your system or application in terms of performance. A closed system with eight users should not be treated equally with a mobile application of more than ten thousand users. So risk based testing techniques like Failure Mode and Effect Analysis (FMEA) should take the stage before announcing our star, performance test, to the stage.

After risk analysis, you can kick-off your performance tests but do you think it is easy to conduct them? If you check the survey Question 7, you can see that having test environment is the most critical bottleneck for performance testing. Most of the companies do not have enough budget, time or expertise to establish a test environment. In Question 8, even 8,5% of the respondents stated that they are utilizing their production, live environment for their performance tests which violates the first prerequisite of testing, having a test environment. Without having a test environment, you can not name testing as testing, it is like playing with a bomb and making it explode before it explodes. So if you want to conduct performance testing, you should invest in your test environment efforts as well.

In comparison with previous years' reports, we are happy to see that not only software testing industry is growing but also the verticals like performance testing in this industry is gaining momentum. If we give a bold answer to our first question of 'Do we really need performance testing?', we can definitely say that 'Yes, every system, every application needs a performance improvement!'

You can access the softcopy of this and previous reports at testistanbul.org and hope to see you at TestIstanbul 2015 conference on March 27th to discuss our further findings.

Turkish Testing Board



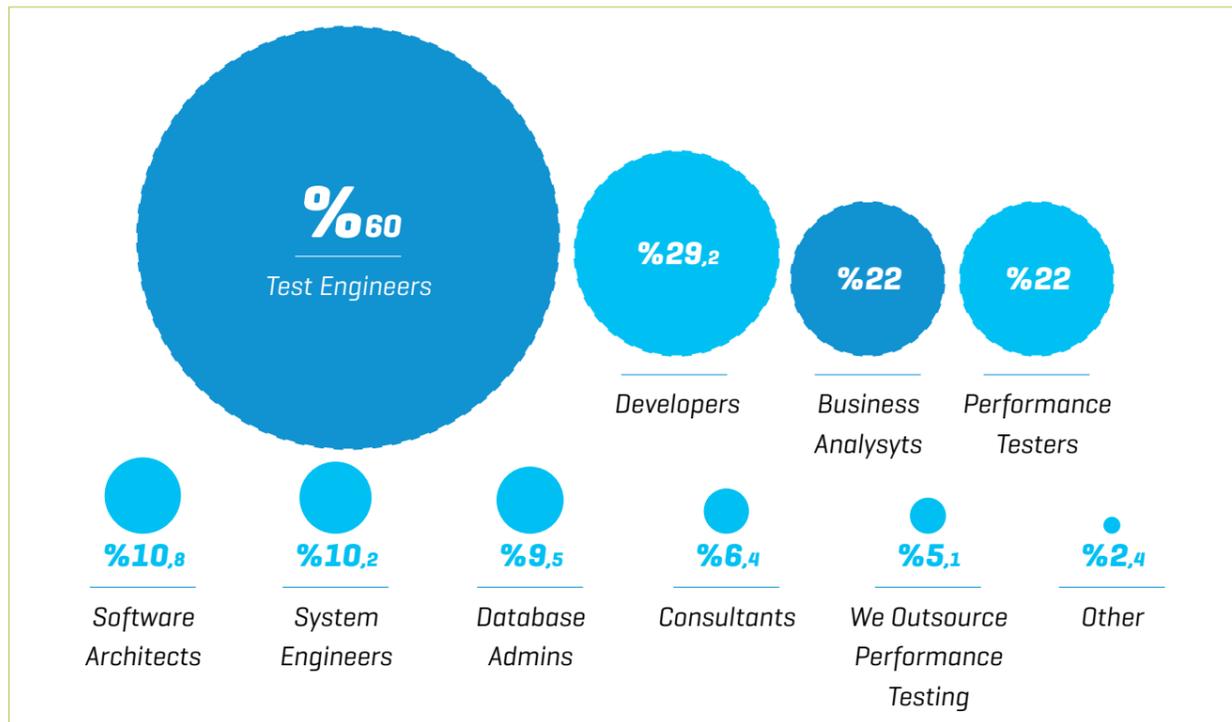
QUESTIONS

- 1.** Who is responsible for performance testing in your organization?
- What are your reasons behind using cloud services for your performance tests?
- 3.** What kind of automation tools are used in your organization?
- What is the most important key performance indicator (KPI) for your performance tests?
- 5.** Who are involved in creation of performance test scenarios?
- How long have you been carrying out performance testing in your organization?
- 7.** What is the most critical shortage for performance testing?
- In which environment(s) do you carry out performance testing?
- 9.** What is the highest number of concurrent users you ever created?
- 10.** What is the highest peak load generated for mobile or web performance tests?

I.

Who is responsible for performance testing in your organization?

[You can select more than one]



Analysis of the current situation

As technology has advanced, performance testing has become increasingly more difficult to be made. That's why companies take into consideration performance testing apart from traditional software testing activities. The survey results indicate that test engineers have the highest rate of responsibility for performance testing. Due to performance testing's need for a technical background like development, this need will cause an increase in the number of technical test engineers in the industry. Developers, performance testers and business analysts follow them with close ratio. The rating of "Performance Testers" option is also remarkable. 22% of respondents stated that performance testers are responsible for performance testing in their organization which shows that specialized test engineers are located in the organizations.

Since the test engineering is a progressing profession in Turkey, we will experience a diversification in its verticals. Performance testing is one of them. Having specialized titles like "performance testers" will lead professional career paths in software test engineering.

Answer Options

Response Percent

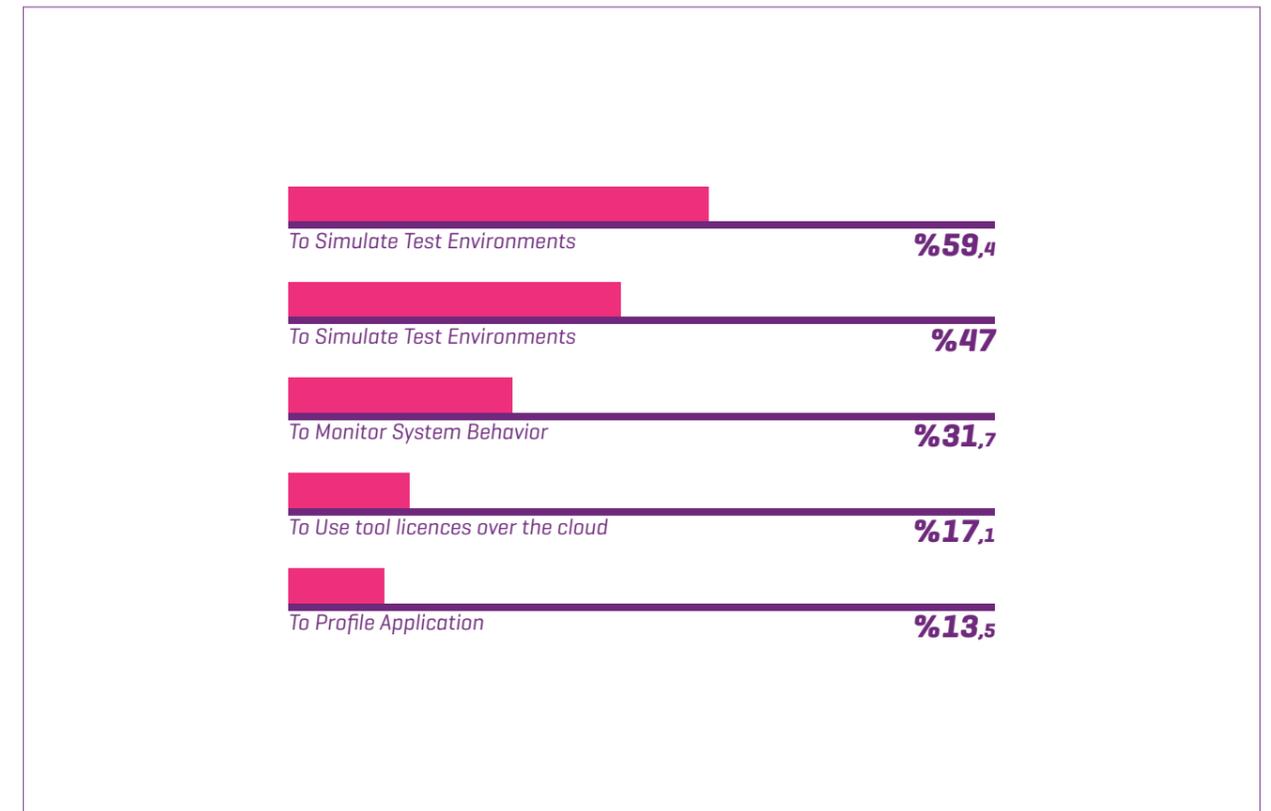
Test Engineers	60,0%
Developers	29,2%
Business Analysts	22,0%
Performance Testers	22,0%
Software Architects	10,8%
System Engineers	10,2%
Database Admins	9,5%
Consultants	6,4%
We outsource performance testing	5,1%
Other	2,4%

Thorough performance testing requires technical knowledge, tool usage, different roles and collaboration among different stakeholders like test engineers, developers, software architects, system engineers etc. This challenging tasks will require well trained, highly skilled test engineers who can see the big picture.

2.

What are your reasons behind using cloud services for your performance tests?

[You can select more than one]



Answer Options

Response Percent

To Simulate Test Environments	59,4%
To Generate Virtual-User Load	47,0%
To Monitor System Behavior	31,7%
To Use tool licences over the cloud	17,1%
To Profile Application	13,5%

Analysis of the current situation

"Although simulating test environments has gotten the highest ranking among other options, it is clear that companies are moving their performance testing efforts to cloud services. Since creating a test environment is the prerequisite of all other efforts stated in the options, it is not surprising that test environment creation is leading the game."

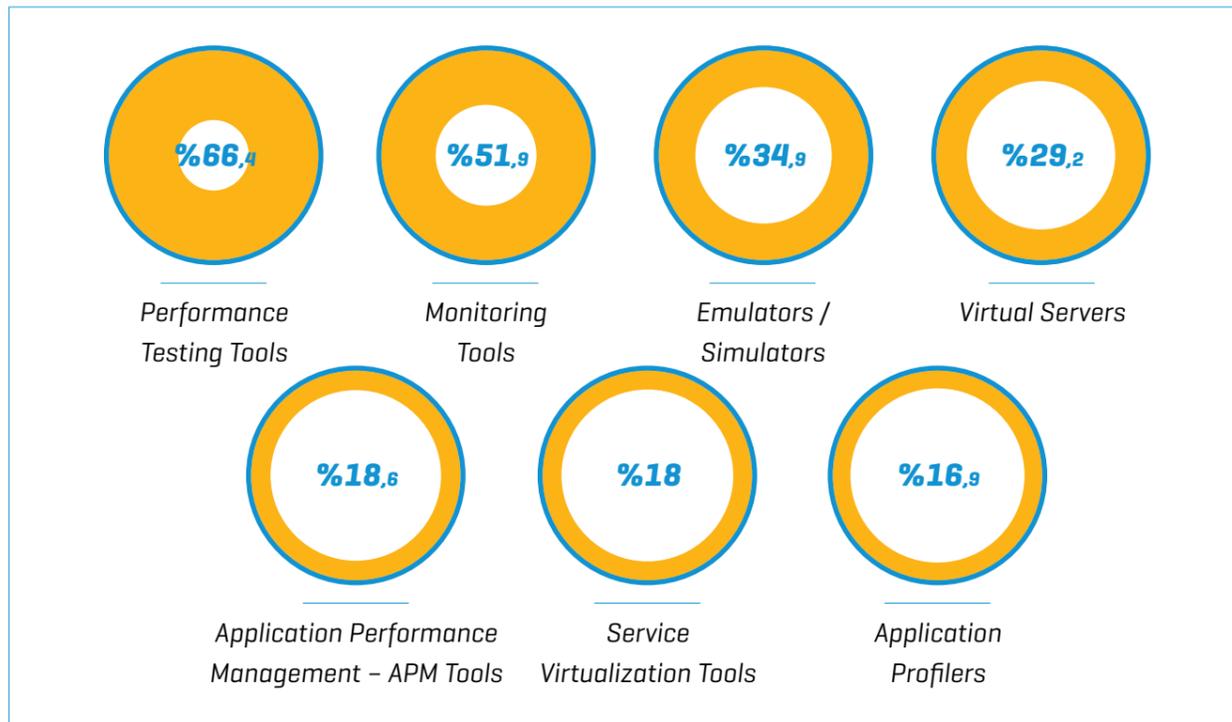
Future predictions

"If we sum up all the percentages of each option, we end up 168,7%. It is apparent that companies are using more than one service provided by cloud services. In near future, we expect that all the performance testing efforts will be carried on cloud services, making the sum 500%."

3.

What kind of automation tools are used in your organization?

[You can select more than one]



Analysis of the current situation

The results of the survey shows that creating a performance load and monitoring its effects on the systems takes the considerable amount of time and effort during their tests.

Testing in application level seems to be less important when compared to whole system's performance testing.



Future predictions

Creating the right amount of performance load on the systems will also be the first item on performance testers' agenda.

As technology and internet speeds have advanced, systems are becoming more and more complex causing distributed and multi-tiered and application level performance testing will gain more importance. Simulator usage will also expand depending on different types of technology penetration [e.g. mobile devices]

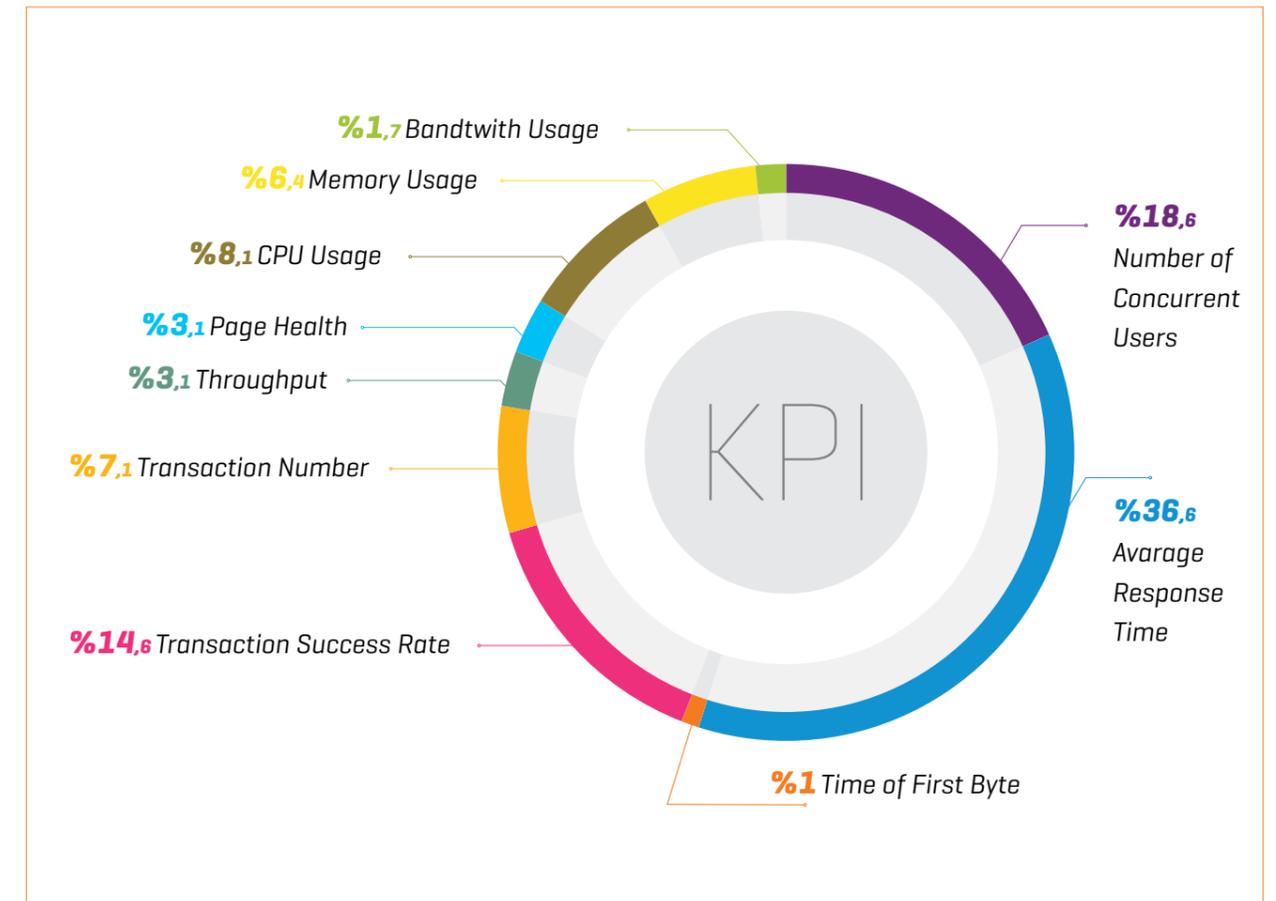
Answer Options

Response Percent

Performance Testing Tools	66,4%
Monitoring Tools	51,9%
Emulators/Simulators	34,9%
Virtual Servers	29,2%
Application Performance Management - APM Tools	18,6%
Service Virtualization Tools	18,0%
Application Profilers	16,9%

4.

What is the most important key performance indicator [KPI] for your performance tests?



Answer Options

Response Percent

Average Response Time	36,6%
Number of Concurrent Users	18,3%
Transaction Success Rate	14,6%
CPU Usage	8,1%
Transaction Number	7,1%
Memory Usage	6,4%
Throughput	3,1%
Page Health	3,1%
Bandwidth Usage	1,7%
Time to First Byte	1,0%

Analysis of the current situation

Speed matters. The survey results show 36,6 % participants are using the average response time as their key performance indicator [KPI].

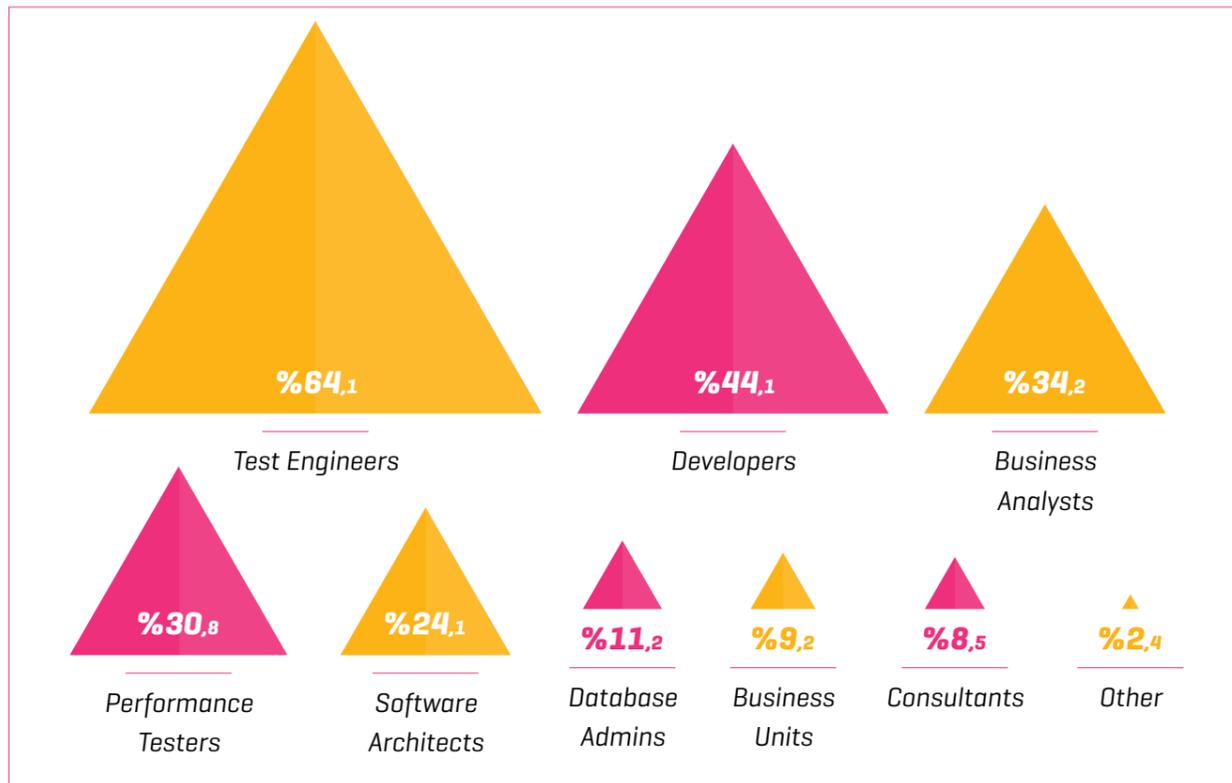
Future predictions

With the increasing importance of big data, the kingdom of speed whose KPI is 'average response' time will be challenged by other KPIs like 'transaction success rate' and 'transaction number'

5.

Who are involved in creation of performance test scenarios?

[You can select more than one]



Analysis of the current situation

In today's world, test engineers are the ones who are involved most in performance test scenario creation. Testers are involved since they know the functional requirements well.

Moreover, developers, software architects and business analysts are also involved widely in performance test scenario creation. Business analysts are aware of the customer expectations, so they have an impact on performance scenario creation. Software architects can see the big picture of the system, so they have an impact on scenarios.



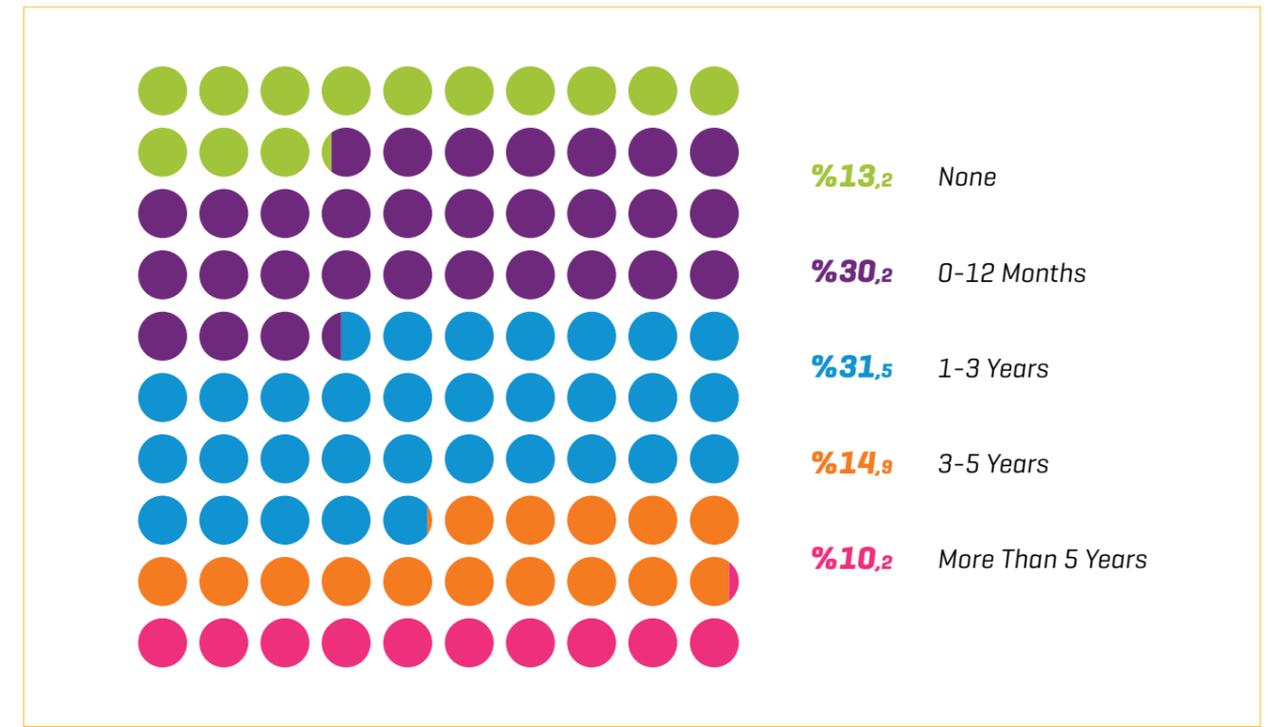
Future predictions

In the future, performance tests will become much more important to provide qualified services. Therefore, performance testers' numbers who are involved in performance test scenario creation will become higher. Moreover, because of cloud performance testing and other new technologies, the number of consultants involved in performance testing will become higher.

Answer Options	Response Percent
Test Engineers	64,1%
Developers	44,1%
Business Analysts	34,2%
Performance Testers	30,8%
Software Architects	24,1%
Database Admins	11,2%
Business Units	9,2%
Consultants	8,5%
Other	2,4%

How long have you been carrying out performance testing in your organization?

6.



Answer Options

Response Percent

None	13,2%
0 - 12 months	30,2%
1 - 3 years	31,5%
3 - 5 years	14,9%
More than 5 years	10,2%

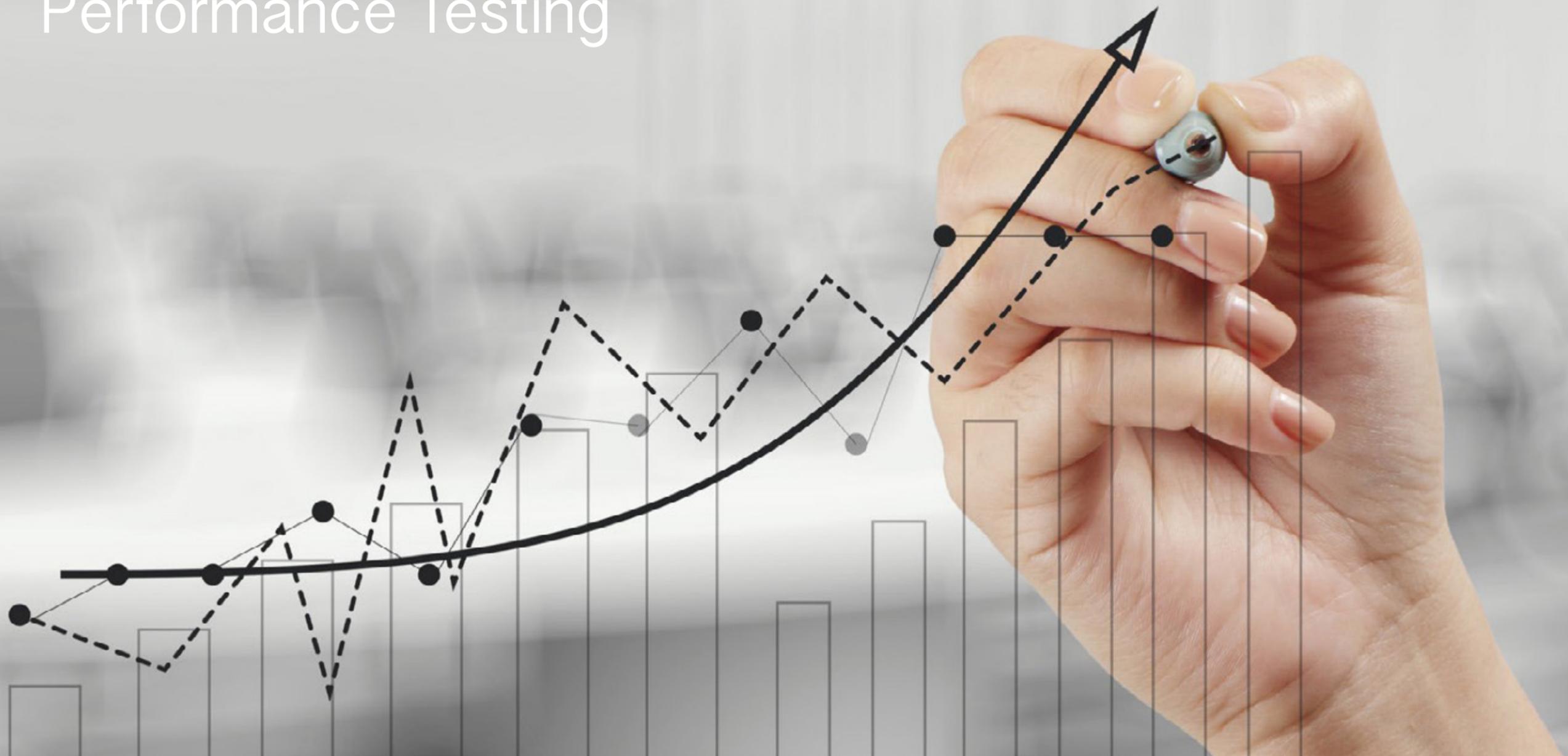
Analysis of the current situation

Survey results indicate that performance tests have gained an important place in the test organization in the recent years. Before 2010, only 10% of the survey contributors had been applying performance tests. With almost a linear increase, this ratio has ramped up to 86,8% in last five years. Only 13% of the respondents have never carried out performance tests in their organization.

Future predictions

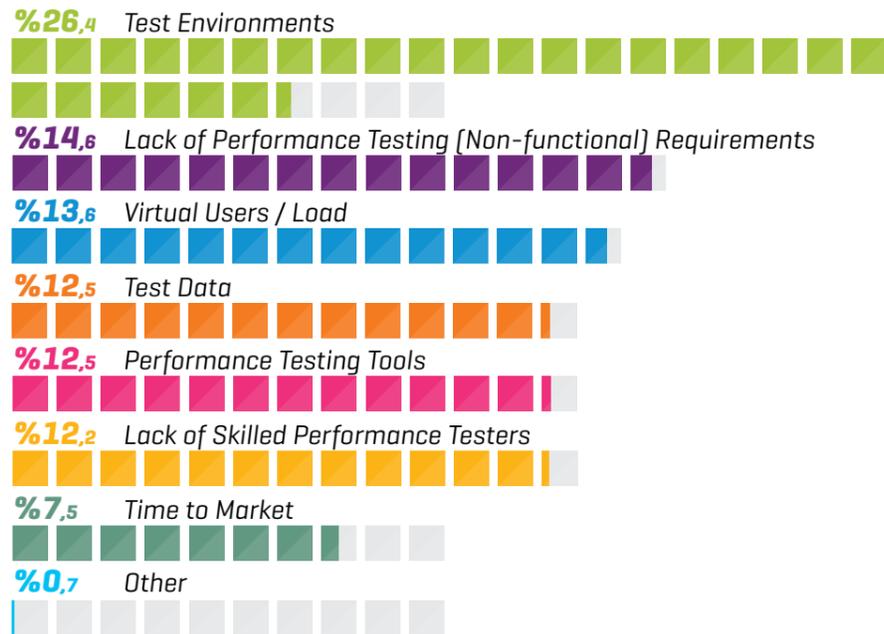
Based on this trend, one can expect that almost every organization will be carrying out performance tests in the next three years. Boost in interest of companies in performance tests may lead to changes in organizations' testing workforce structure. Training and job opportunities in this specialization may also be expected to raise in near future.

“Business Driven ”
Performance Testing”



7.

What is the most critical shortage for performance testing?



Analysis of the current situation



Around 26% of the survey respondents indicate that the most critical shortage for performance testing is the test environments. Respondents do indicate that, test environments generally do not possess similar CPU, memory, database and hardware characteristics as production environments.

As a consequence, performance criteria/requirements needs to be developed carefully and performance test results should be properly scaled for better accuracy.

Other than the above, companies are often struggling for the reasons that they do not have business-driven performance requirements [14,6%], sufficient resources for simulating virtual users [13,6%], properly prepared test data [12,5%] and skilled performance testers. These shortages, beyond any doubt, are preventing companies in doing effective, rigorous and comprehensive performance testing.

Answer Options

Answer Options	Response Percent
Test Environments	26,4%
Lack of Performance Testing (Non-functional) Requirements	14,6%
Virtual Users/Load	13,6%
Test Data	12,5%
Performance Testing Tools	12,5%
Lack of Skilled Performance Testers	12,2%
Time to Market	7,5%
Other	0,7%

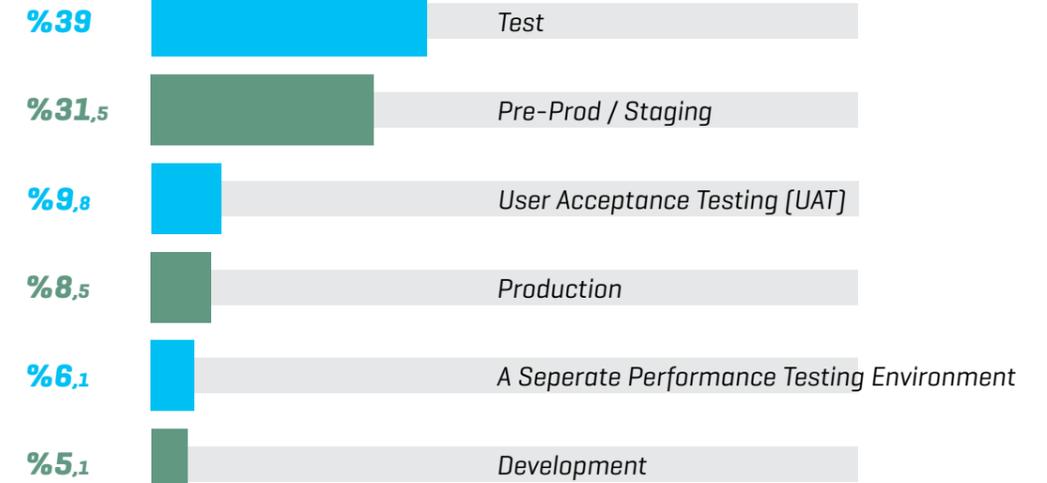
Future predictions



Within the near future, we expect test virtualization to become one of the most integral parts of any performance testing activity because of the fact that, it brings numerous benefits in establishing adequate test environments. Other than that, we will observe more performance testing in the cloud. To explain it more clearly, we expect to see more cloud usage in simulating user loads, handling performance tool issues/ licences, and establishing test environments.

8.

In which environment(s) do you carry out performance testing?



Answer Options

Answer Options	Response Percent
Test	39,0%
Pre-Prod / Staging	31,5%
User Acceptance Testing [UAT]	9,8%
Production	8,5%
A Seperate Performance Testing Environment	6,1%
Development	5,1%

Analysis of the current situation



The environment is one of the biggest challenges of performance testing. It needs to be carried out in production like environments to identify real performance issues during testing cycle. However, it is not always possible to build production like environments for performance testing.

According to survey results, most companies conduct performance tests in test and pre-prod/staging environments. Even 9.8% of respondents state that they carry out performance testing in UAT environment, while 8.5% of participants choose production environment for performance testing. Only 6.1% of participants have a separate environment to carry out performance testing.

Future predictions



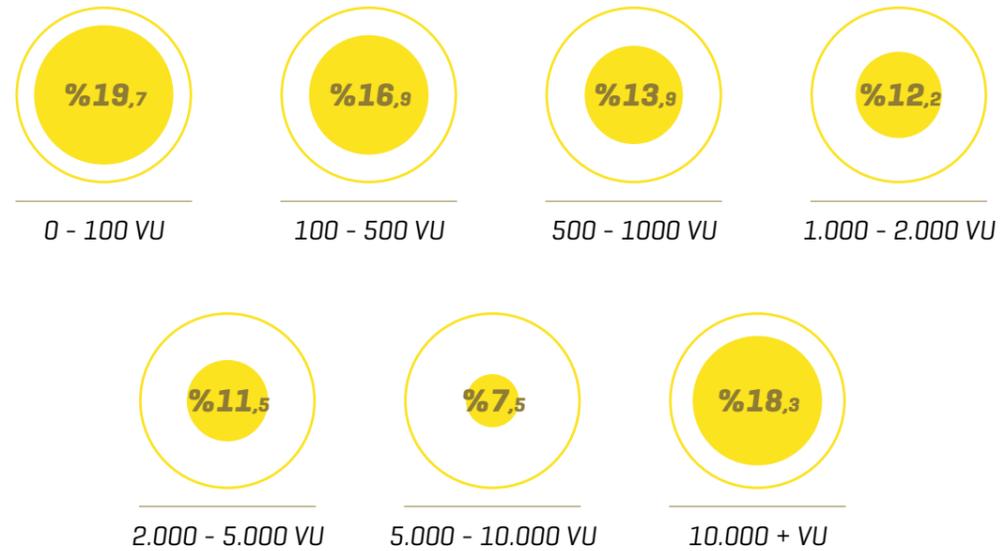
Ideally, performance testing is performed on exact copy of live production environment including applicaton components, configuration, etc.

In practice, there are constraints and it is challenging to build a test environment including real-life demand simulations. Maintaining a production environment replica is expensive and most companies try avoiding these expenses by switching to a low capacity environment. The end result is scaled down performance test environment.

Additionally, the cloud is the best alternative which provides a temporary and unlimited amount of capacity to be used for performance testing. Real world traffic can be simulated. The companies will prefer using the cloud to uncover potential obstacles at any scale in performance testing phase.

9.

What is the highest number of concurrent users you ever created?



Analysis of the current situation

There is almost an evenly distribution among the respondents depending on the virtual user count. Almost one fifth of the respondents used 10000+ virtual users.



Future predictions

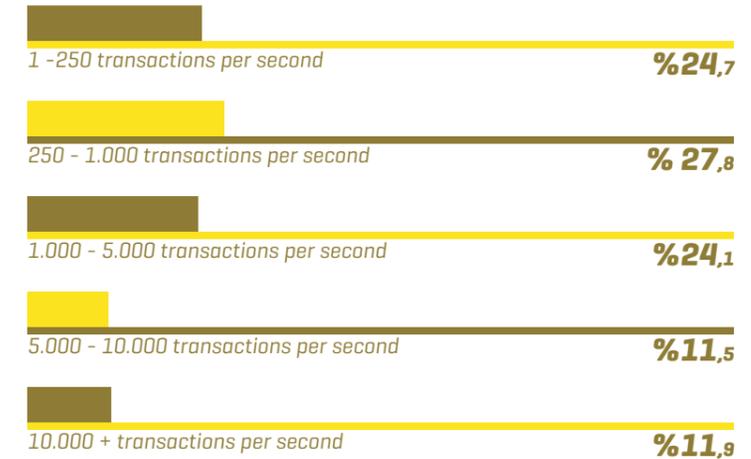
The current situation shows that there is no one size fits all approach in performance testing. Every company, every system has its own unique characteristics and needs depending on their users' usage patterns.

As for future prediction, we can only say that there will be a tendency to create more VUs for any system compared to their current performance load.

Answer Options	Response Percent
0 - 100 VU	19,7%
100 - 500 VU	16,9%
500 - 1.000 VU	13,9%
1.000 - 2.000 VU	12,2%
2.000 - 5.000 VU	11,5%
5.000 - 10.000 VU	7,5%
10.000 + VU	18,3%

What is the highest peak load generated for mobile or web performance tests?

10.



Answer Options	Response Percent
1 - 250 transactions per second	24,7%
250 - 1000 transactions per second	27,8%
1000 - 5000 transactions per second	24,1%
5000 - 10000 transactions per second	11,5%
10.000 + transactions per second	11,9%

Analysis of the current situation



Survey results indicate that many enterprises are taking performance testing into account like they never did before. The best inference for such high number of transactions might be, major players operating in different domains such as Telecommunication, Banking, E-Commerce and Media test their applications in performance manner as well as functionality.

Those companies aware of the fact users' expectations for performance are increasing and applications they are accessing are becoming ever more critical to the business.

Future predictions



According to survey results, it seems availability of services under stress conditions will be more important in the future.

Especially, with the rise of "Internet of Things" phenomenon, we will witness performance/stress tests generating many times higher loads, which simply means more transaction in given time.

ABOUT



Turkish Testing Board (TTB) is the regional body representing and supporting software testing professionals in Turkey. The TTB was constituted in Istanbul in September 2006 as a non-profit organisation and a member of the International Software Testing Qualifications Board (ISTQB).

TTB is responsible for certification of testing professionals to the standards and syllabi laid down by the ISTQB. TTB also acts to generate public awareness of the economic and risk mitigation benefits that professional software testing practice offers.

www.turkishtestingboard.org



TestIstanbul is the largest conference in South East Europe and Middle East on software testing. TestIstanbul introduces the region not only to the advancements in software testing but also to the advancements in other streams of SDLC like business analysis, design, development and usability. With its almost 700 participants from all over the world every year, TestIstanbul creates a healthy discussion and networking platform for IT professionals and companies.

www.testistanbul.org



ISTQB is a global, non-profit organization responsible for enabling test professionals, through globally accepted software testing certification standards to support their career development. As of September 2013, ISTQB has issued over 320.000 certifications in more than 70 countries

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