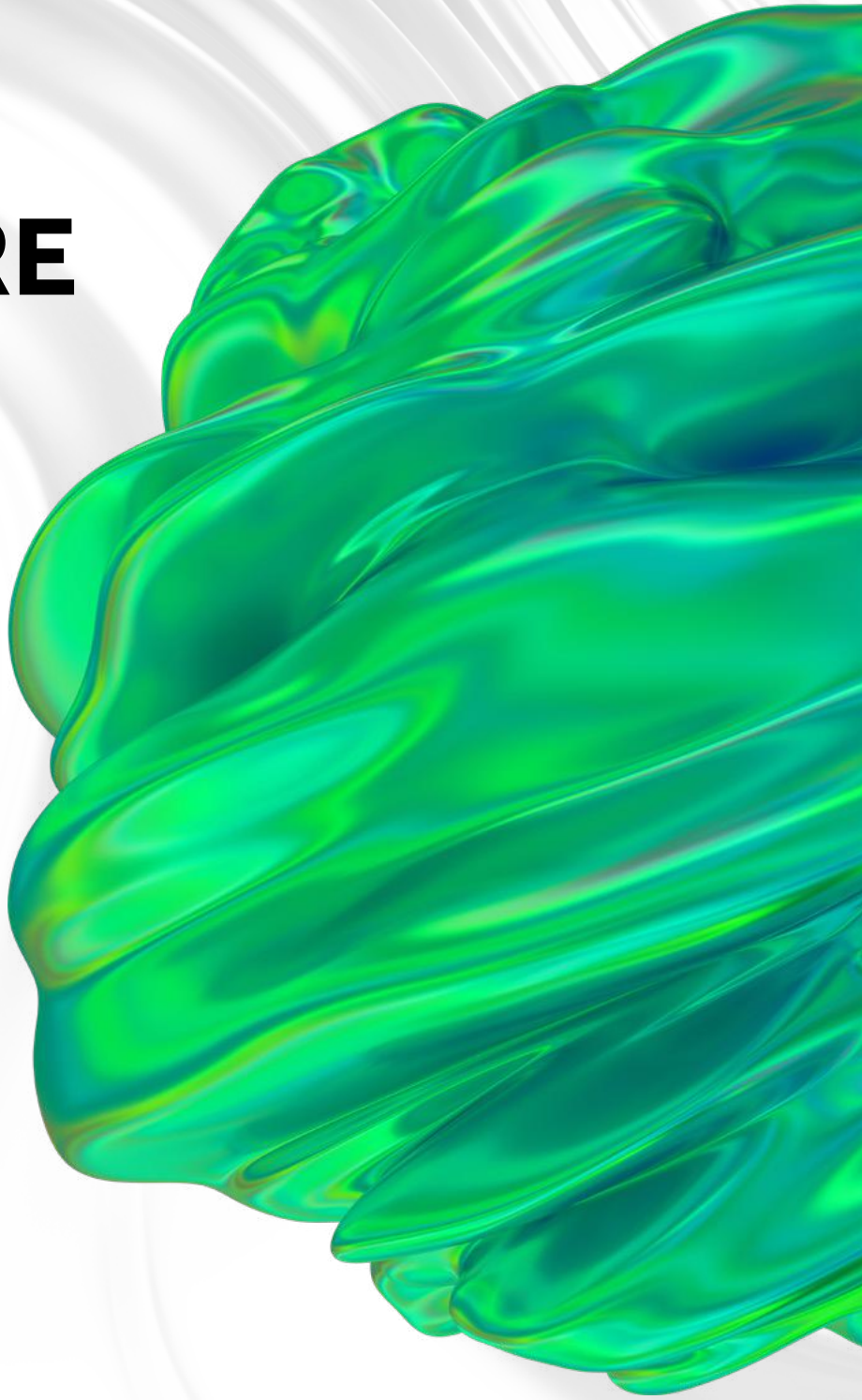
TURKEY **SOFTWARE QUALITY** REPORT

2022-2023

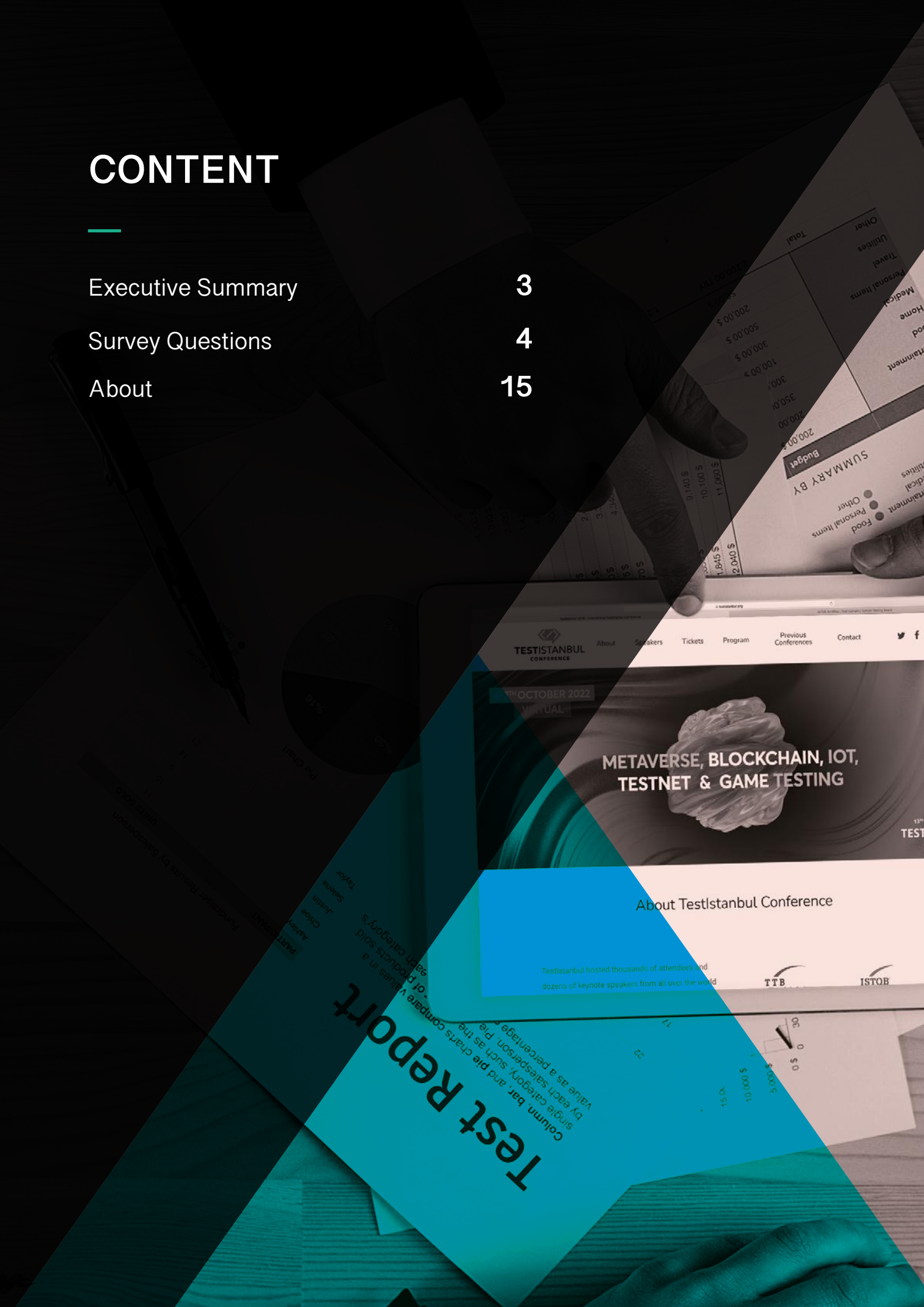
METAVERSE, BLOCKCHAIN, IoT, TESTNET & GAME TESTING



TTB
Turkish Testing Board
www.turkishtestingboard.org

ISTQB
International Software Testing Qualifications Board
www.istqb.org

CONTENT



EXECUTIVE SUMMARY

Blockchain, game and IoT are the main drivers behind information technology (IT) systems' current massive growth. But many challenges lay behind. According to the survey, the main challenge while testing blockchain, game and IoT systems is:

- Lack of testing know-how about these systems.

As stated in the opening keynote of 13th International TestIstanbul conference, clues for these unknown territories can be found in fundamental sciences. As for blockchain testing, "The Seven Bridges of Königsberg" graph theory was given as one of them.

With the acceleration of the need for testing of blockchain, game and IoT systems, many software testing tools are introduced to the market. According to the survey, top three tools for each of them are as follows:

- Blockchain testing tools: Ethereum Tester, BitCoinJ, Populus
- Game testing tools: Selenium, Appium, Unity Automated Testing
- IoT testing tools: Wireshark, Digital Storage Oscilloscope, JTAG Dongle

Testing know-how and testing tools blended with appropriate test techniques will bring success for testing efforts. According to the survey, following are the most commonly used test techniques while testing blockchain, game and IoT systems:

- Use case testing
- Boundary value analysis

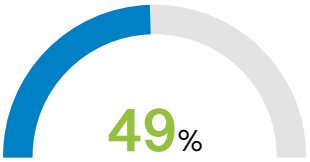
Finally, survey pinpoints the tremendous need for testing these systems. 74% survey participants stated that they are expecting a growth in their testing teams. Even 6% is expecting a more than 50% growth.

QUESTIONS

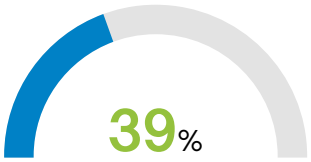
1. WHAT ARE THE TOP RISKS AND/OR CHALLENGES WHILE TESTING BLOCKCHAIN SYSTEMS?
2. WHAT ARE THE TOP RISKS AND/OR CHALLENGES WHILE TESTING GAMES/ METAVERSES?
3. WHAT ARE THE TOP RISKS AND/OR CHALLENGES WHILE TESTING IoT SYSTEMS?
4. WHICH TOOLS ARE USED FOR TESTING BLOCKCHAIN SYSTEMS IN YOUR ORGANIZATION?
5. WHICH TOOLS ARE USED FOR TESTING GAMES/METAVERSES IN YOUR ORGANIZATION?
6. WHICH TOOLS ARE USED FOR TESTING IoT SYSTEMS IN YOUR ORGANIZATION?
7. WHICH TEST TECHNIQUES DO YOU USE FOR TESTING BLOCKCHAIN SYSTEMS?
8. WHICH TEST TECHNIQUES DO YOU USE FOR TESTING METAVERSES/ GAMES?
9. WHICH TEST TECHNIQUES DO YOU USE FOR TESTING IoT SYSTEMS?
10. FOR THE NEXT 12 MONTHS, WHAT IS THE GROWTH EXPECTATION FOR THE TEST TEAM IN YOUR ORGANIZATION?

WHAT ARE THE **TOP RISKS** AND/ OR **CHALLENGES** WHILE TESTING BLOCKCHAIN SYSTEMS?

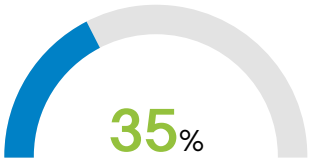
** multiple selection was allowed*



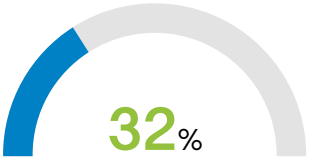
49%
Lack of know-how about blockchain systems testing



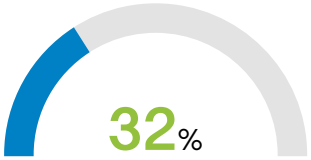
39%
Security and privacy issues



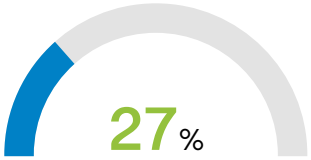
35%
Lack of suitable test environment



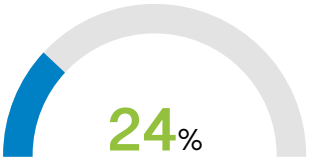
32%
Lack of process know-how



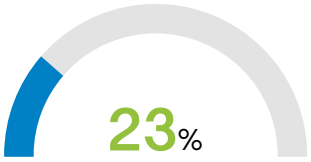
32%
Lack of suitable test data



27%
We do not test blockchain systems

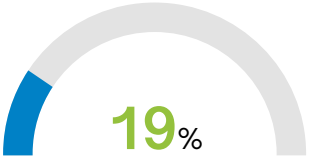


24%
We do not have blockchain systems

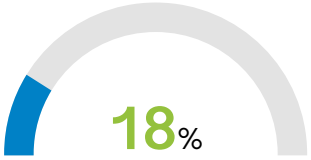


23%
Technical complexity

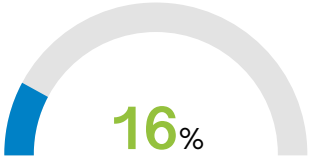
20%
Performance issues



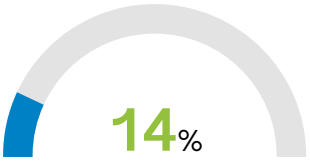
19%
Operational risks



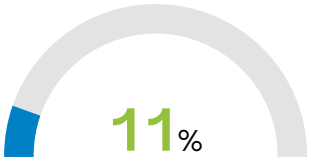
18%
Lack of best practices



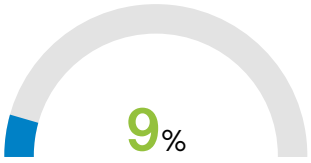
16%
Tool problems



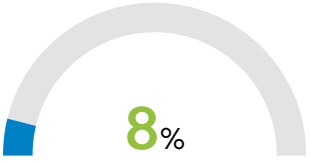
14%
Ownership problems



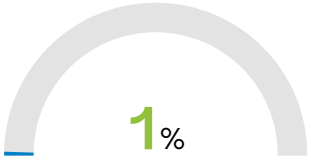
11%
Business process stability



9%
Team capacity



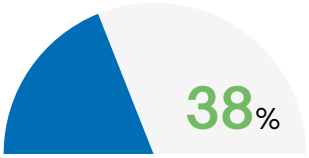
8%
Unable to deal with scale



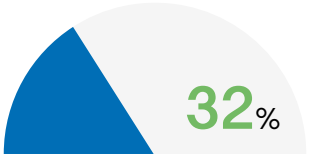
1%
None

2 WHAT ARE **THE TOP RISKS** AND/OR **CHALLENGES** WHILE **TESTING GAMES/ METAVERSES?**

** multiple selection was allowed*

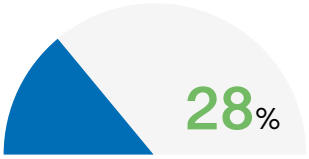


Lack of know-how about games/ metaverses testing



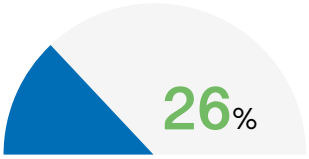
We do not test games/ metaverses

We do not have games/ metaverses

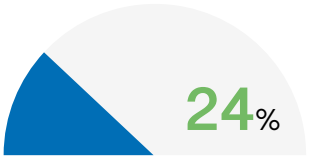


Lack of process know-how

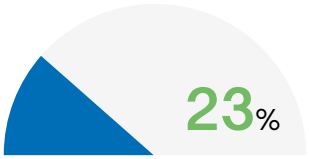
Performance issues



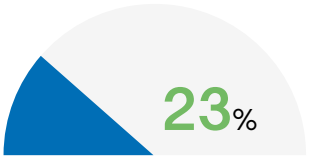
Technical complexity



Lack of suitable test environment



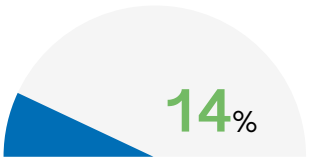
Lack of suitable test data



Security and privacy issues

Lack of best practices

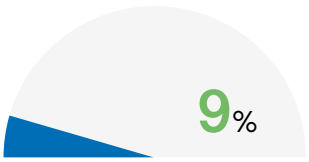
Tool problems



Unable to deal with scale

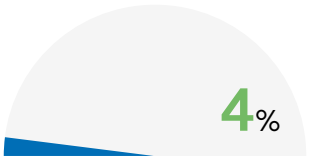
Ownership problems

Business process issues



Operational risks

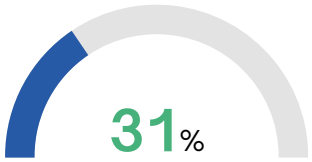
Team capacity



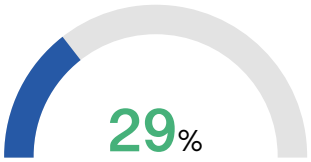
None

3 WHAT ARE **THE TOP RISKS** AND/OR **CHALLENGES** WHILE **TESTING IoT SYSTEMS?**

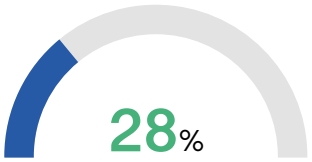
** multiple selection was allowed*



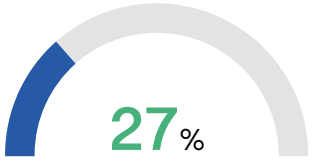
31%
Security and privacy issues



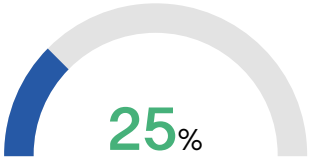
29%
Lack of suitable test environment



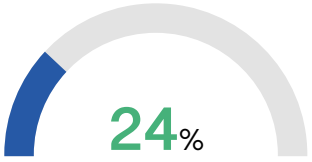
28%
We do not have IoT systems



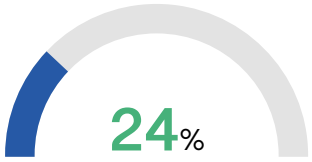
27%
Technical complexity



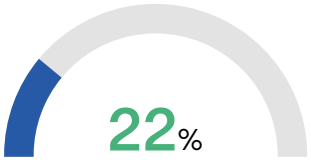
25%
Lack of suitable test data



24%
Lack of know-how about IoT systems testing

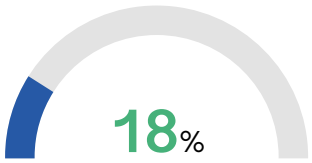


24%
Performance issues

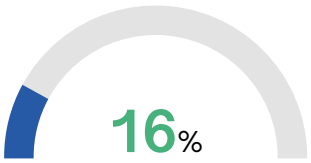


22%
We do not test IoT systems

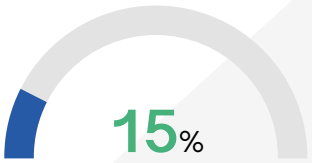
20%
Lack of process know-how



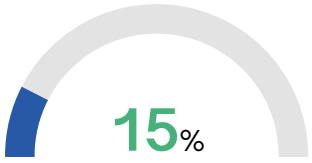
18%
Lack of best practices



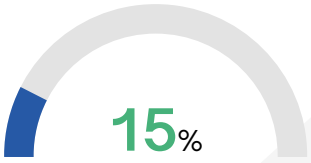
16%
Unable to deal with scale



15%
Business process issues

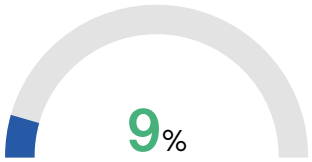


15%
Operational risks

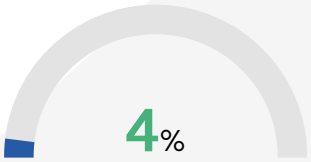


15%
Tool problems

12%
Team capacity



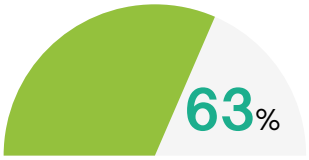
9%
Ownership problems



4%
None

WHICH **TOOLS** ARE USED FOR **TESTING BLOCKCHAIN SYSTEMS** IN YOUR ORGANIZATION?

** multiple selection was allowed*



We do not have blockchain systems

We do not test blockchain systems

Ethereum Tester

BitCoinJ

Populus

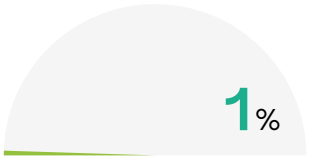
Hyperledger Composer

Truffle

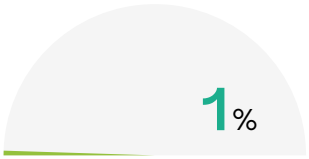
Ganache

Exonum TestKit

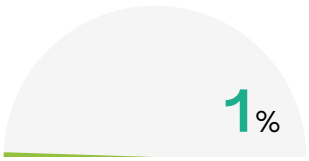
Corda testing tool



Embark



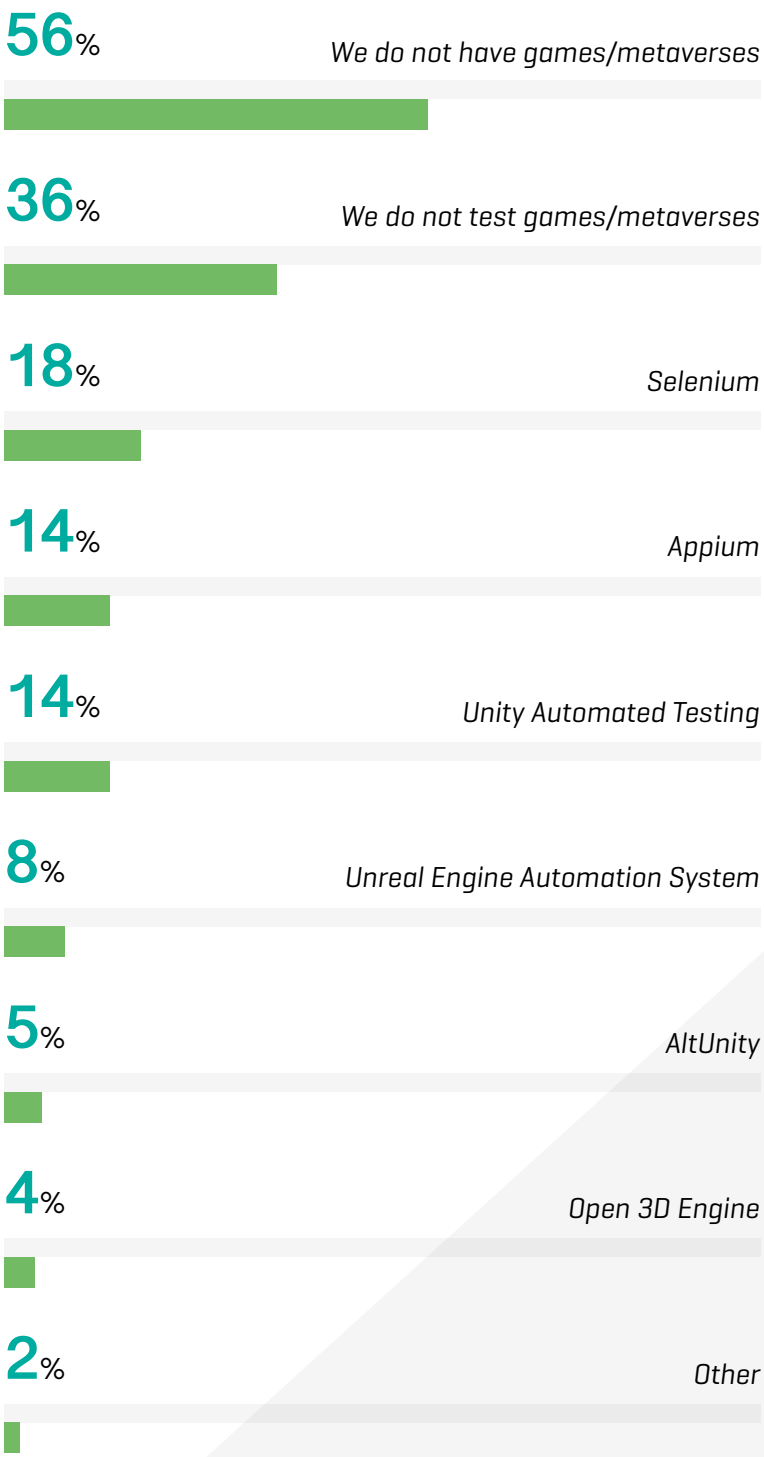
Manticore



Other

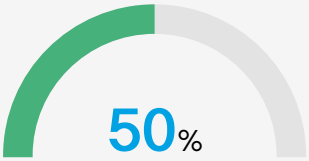
5 WHICH **TOOLS** ARE USED FOR **TESTING GAMES/METAVERSES** IN YOUR ORGANIZATION?

** multiple selection was allowed*

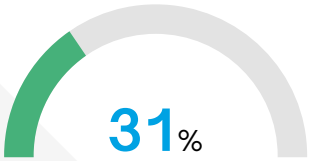


6 WHICH **TOOLS** ARE USED FOR **TESTING IoT SYSTEMS** IN YOUR ORGANIZATION?

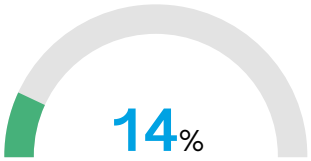
** multiple selection was allowed*



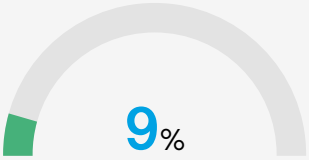
50%
We do not have IoT systems



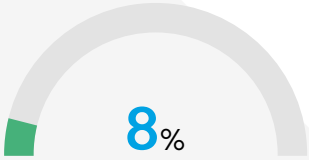
31%
We do not test IoT systems



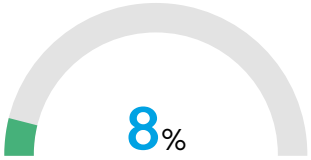
14%
Wireshark



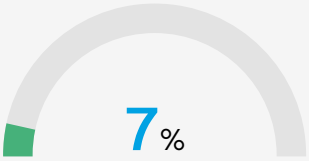
9%
Digital Storage Oscilloscope



8%
JTAG Dongle



8%
MQTT Spy



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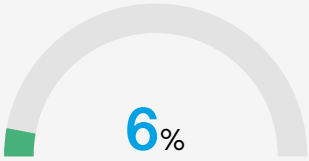
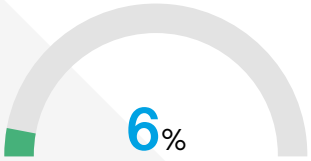
Tcpdump



6%
IoTIFY



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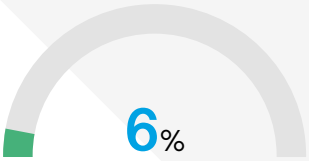
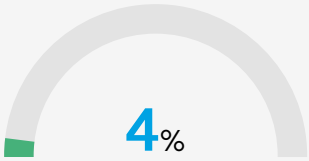
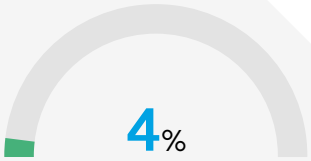
Software Defined Radio



6%
Spectrum Analyzer



4%
Shodan



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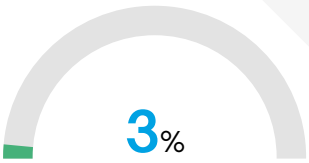
SOASTA CloudTest



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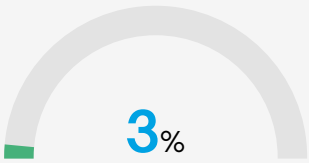
Blazemeter



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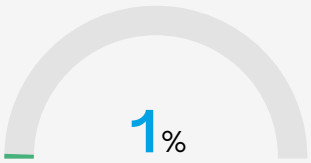
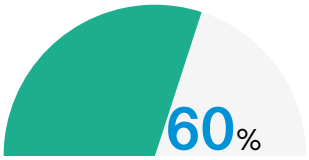
Thingful



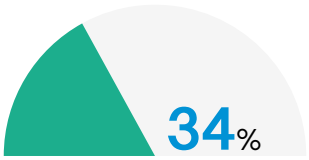
1%
Other

WHICH **TEST TECHNIQUES** DO YOU USE FOR **TESTING BLOCKCHAIN SYSTEMS?**

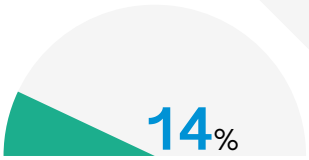
** multiple selection was allowed*



We do not have blockchain systems

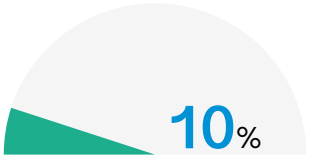


We do not test blockchain systems

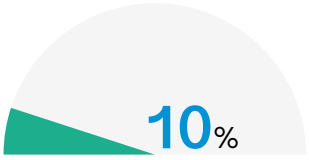


Use Case Testing

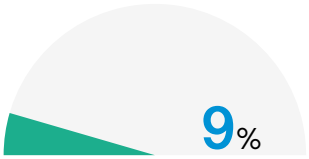
Boundary Value Analysis



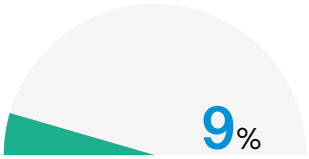
Decision Coverage



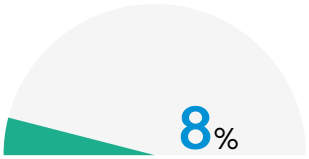
Pair-wise Testing



Decision Tables

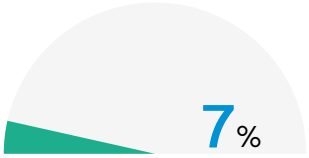


Equivalence Partitioning

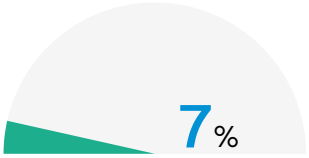


Attacks

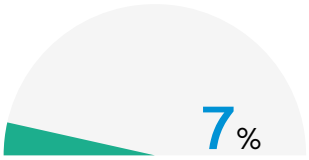
Path Testing



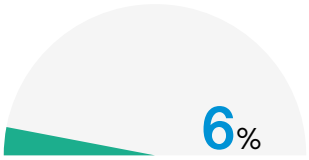
Checklist Based



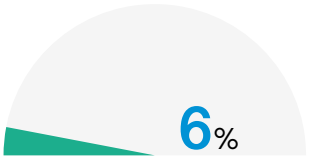
Classification Tree



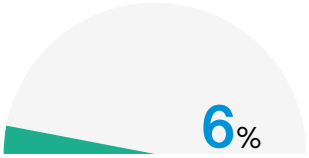
Exploratory Testing



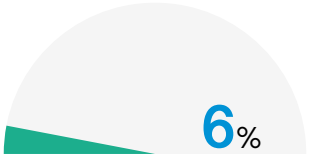
Error Guessing



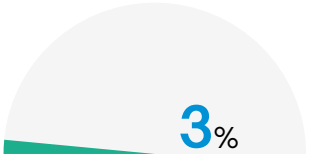
Modified Condition/Decision Testing



Multiple Condition Testing



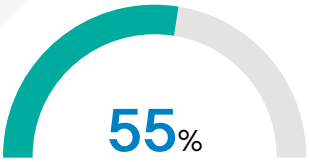
State Transition



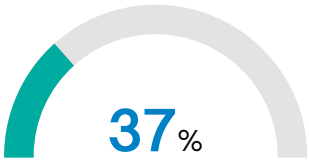
Statement Coverage

WHICH **TEST TECHNIQUES** DO YOU USE FOR **TESTING METAVERSES/GAMES?**

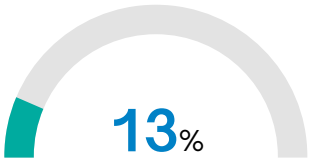
** multiple selection was allowed*



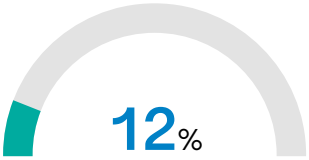
55%
We do not have games/ metaverses



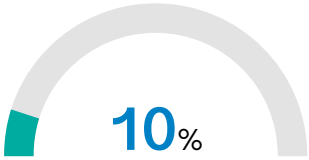
37%
We do not test games/ metaverses



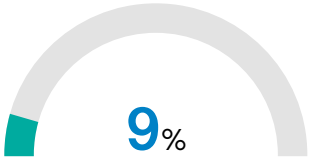
13%
Exploratory Testing



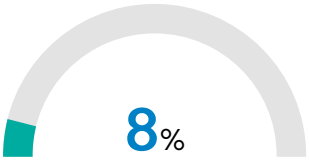
12%
Use Case Testing



10%
Classification Tree



9%
Error Guessing



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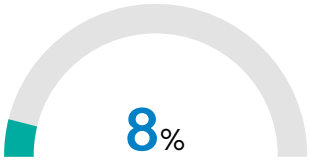
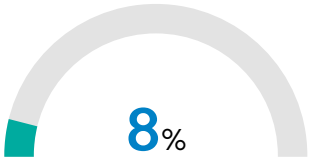
Boundary Value Analysis



8%
Checklist Based



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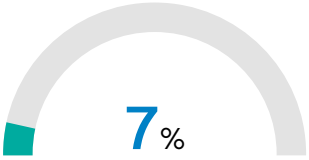
Equivalence Partitioning



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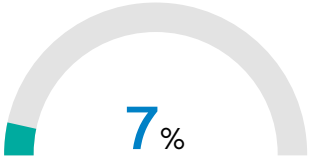
Attacks



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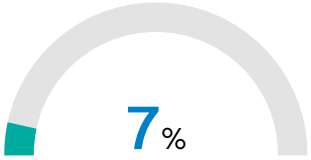
Decision Coverage



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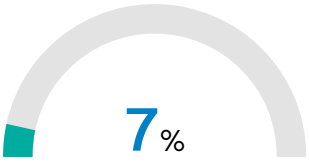
Multiple Condition Testing



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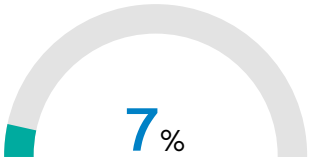
Pair-wise Testing



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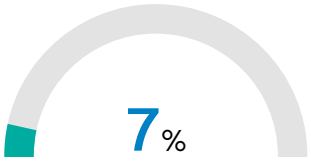
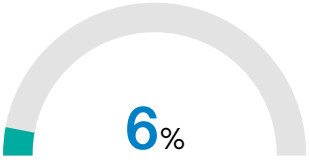
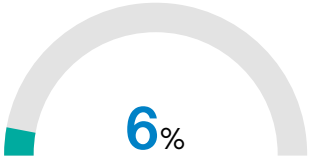
Path Testing



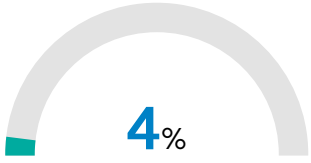
7%
State Transition



6%
Decision Tables



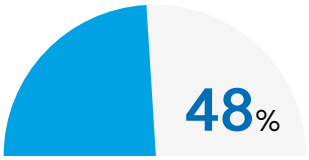
6%
Modified Condition/Decision Testing



4%
Statement Coverage

WHICH **TEST TECHNIQUES** DO YOU USE FOR **TESTING IoT SYSTEMS?**

** multiple selection was allowed*



We do not have IoT systems

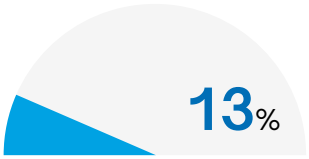
We do not test IoT systems

Use Case Testing

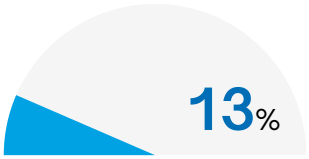
Classification Tree

Decision Tables

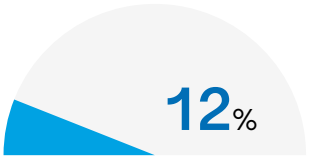
Boundary Value Analysis



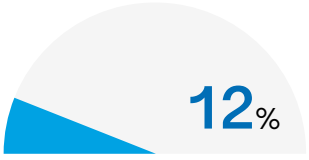
Checklist Based



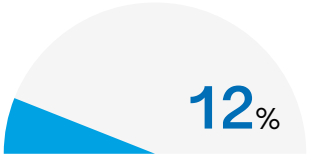
Error Guessing



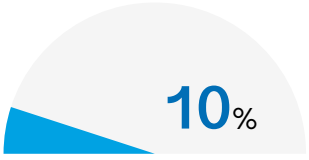
Decision Coverage



Equivalence Partitioning



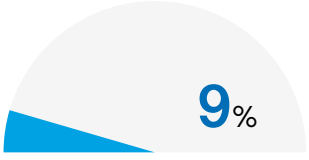
Exploratory Testing



Attacks

Modified Condition/Decision Testing

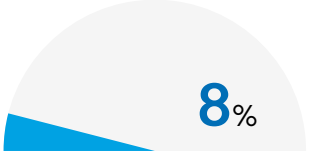
Multiple Condition Testing



Pair-wise Testing

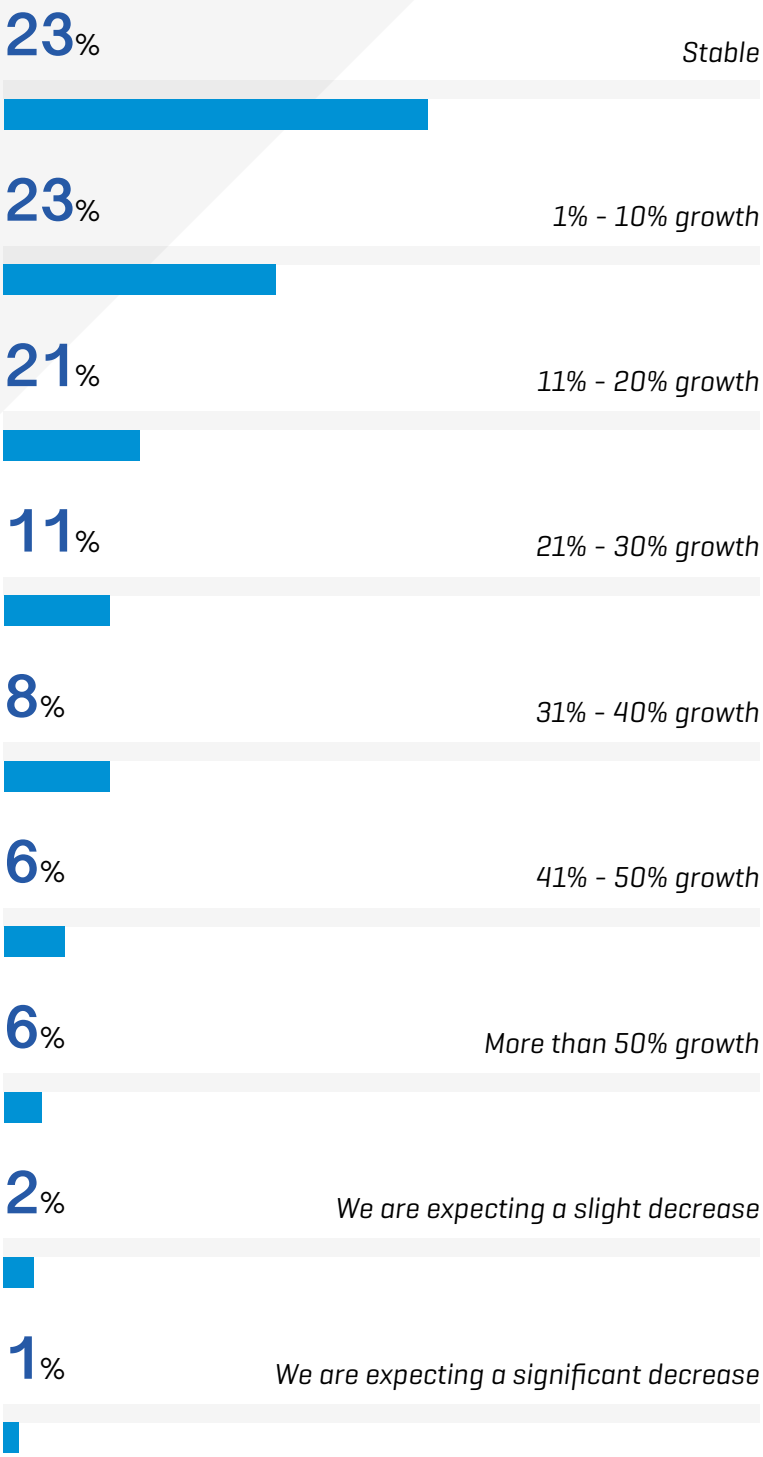
State Transition

Path Testing



Statement Coverage

10 FOR **THE NEXT 12 MONTHS**, WHAT IS **THE GROWTH EXPECTATION FOR THE TEST TEAM** IN YOUR ORGANIZATION?



ABOUT

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 January 2022, ISTQB® has administered over 1,1 million exams and issued more than 806k certifications in over 130 countries world-wide. The scheme relies on a Body of Knowledge (Syllabi and Glossary) and exam rules that are applied consistently all over the world, with exams and supporting material being available in many languages.

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- ISTQB® Certified Tester Foundation Level
- ISTQB® Certified Tester Foundation Level Agile Tester
- Certified Tester AI Testing - Specialist
- Certified Tester Performance Testing - Specialist
- Certified Tester Test Automation Engineer - Advanced Level
- Certified Tester Test Manager - Advanced Level
- Certified Tester Test Analyst - Advanced Level
- Certified Tester Technical Test Analyst - Advanced Level

www.**turkishtestingboard**.org

Turkish Testing Board has been organizing International TestIstanbul Conferences since 2010. In the last thirteen conferences, 50 keynotes and more than 6,500 participants from 53 countries were hosted. Turkish Testing Board is a non-profit organization, the profit of TestIstanbul Conferences is donated to scholarships.

Panels & Events

The board organizes sector or topic-based panels for the development of the software testing industry. More than 1,300 professionals have attended the events. The panels and events held so far are TestFinance, TestInsurance, TestAnkara, Testİzmir, TestGames, TestFinTech, TestDefence.

Translation Projects

The translation group within the board works on the translation of ISTQB® documents in order to bring international software testing terminology to Turkey. Documents translated so far are as follows:

- ISTQB® International Certified Foundation Level Software Testers Syllabus 2011
- ISTQB® International Certified Fundamental Level Software Testers Syllabus 2018
- ISTQB® Software Testing Glossary
- ISTQB® International Certified Advanced Level - Test Analyst 2012
- TMMi in the Agile World

www.**testistanbul**.org

TURKEY SOFTWARE QUALITY REPORT

2022-23

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TTB Turkish Testing Board www.turkishtestingboard.org