425 — Western Europe
105 — Southern Europe
165 — Nordics
90 — Eastern Europe
300 — North America
60 — Middle East Asia
100 — Southeast Asia
35 — Japan
80 — Latin America
150 — UK & Ireland
90 — Australia & New Zealand

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116 Automotive

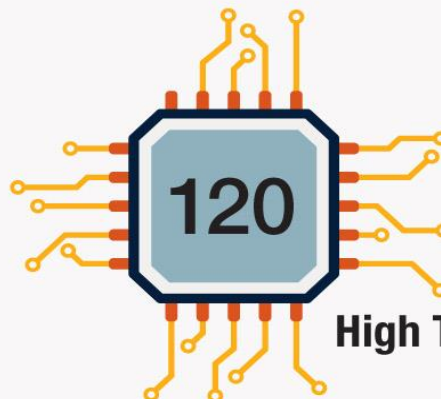129 Healthcare and Life Sciences

318 Financial Services

215 Telecommunications, Media & Entertainment

151 Consumer Products, Retail and Distribution

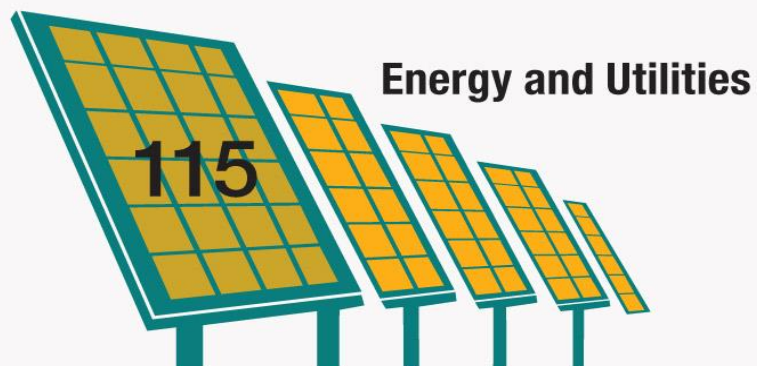120 High Tech

245 Public Sector/ Government

115 Energy and Utilities

85 Transportation

106 Manufacturing

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The 2016-2017 World Quality Report examines the state of quality and testing across multiple industries and 33 countries for 8th time in a row

- **Digital Transformation**
- **IoT and Security**
- **Agile and DevOps**
- **Industrialization and TCoE**
- **Test Environments and Test Data Management**
- **QA & Test Budgets**

Regional & sector insights

Benelux

Steven van Schil
Vice President, Testing Practice Executive,
Sogeti Belgium and Luxembourg

Marco van den Brink
Managing Director Testing and Quality
Sogeti, Netherlands

Olivier Vandekerkhove
Testing & Quality Management Skillcenter
Manager, Capgemini, Belgium

IMPORTANT TRENDS

- Organizations across the region are increasingly interested in setting up joint Centers of Excellence, where they can outsource the technical aspects of testing while maintaining direct control over the business and management aspects.

- 58% of survey respondents from Benelux, as opposed to 39% worldwide, use DevOps for more than half of their projects.

- 27% of all test cases in Benelux, as opposed to 29% worldwide, are automated.

Top 10 most important aspects of your IT strategy

Digital transformation

Increasing pressure on quality assurance testing to deliver customer value and competitiveness

Main recommendation

Intelligent QA and test platforms

Most challenging aspects of testing digital implementation

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Challenges in testing mobile and Multi-channel (Mobile, Wearables, Social, and Traditional) applications

Legend: 2016, 2015, 2014

Challenge	2016	2015	2014
Don't have the right testing process / method	48%	28%	36%
No mobile testing experts	46%	29%	33%
Don't have in-house testing environment	46%	38%	30%
Don't have the right tools to test	45%	26%	34%
Not enough time to test	44%	36%	40%
Don't have the devices readily available	44%	26%	35%
We don't do mobile testing	1%	8%	13%

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IoT

Potential increase on impact of failure, with 68% of organizations not having a specific strategy for testing IoT

Main recommendation

IoT test strategy

Opportunities for solutions for IoT testing

54%
Operational Intelligence (improved diagnostics, device data recorders and players)

51%
Virtualization of IoT services and APIs

50%
Tools for stress testing IoT middleware and gateways

47%
Protocol and Device simulators

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Commonly performed security testing activities

Legend: ■ 2016 ■ 2015

Activity	2016	2015
Static application security testing	50%	52%
Dynamic application security testing	49%	57%
Manual code review	49%	52%
Penetration Testing	43%	39%

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Agile and DevOps

Achieve speed with right level of quality

Main recommendation

QA enablement for DevOps

Challenges faced in applying testing to agile development

Challenge	2016	2015
Early involvement of testing team in inception phase or sprint planning	44%	
Difficulty in identifying the right areas on which test should focus	44%	33%
Lack of appropriate test environment and data	43%	31%
Lack of a good testing approach that fits with the agile development method	43%	29%
Lack of professional test expertise in agile teams	43%	31%
Inability to apply test automation at appropriate levels	41%	23%
Difficulty to re-use and repeat tests across sprints/iterations	40%	29%
No real difficulties with testing in agile	1%	18%

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Approaches to testing in agile

Legend: ■ 2016 ■ 2015

- We use predictive analytics to determine or optimize test coverage: 2016 — 45%
- We use Test Driven Development (TDD) and or Behaviour Driven Development (BDD): 2016 — 45%, 2015 — 48%
- We use continuous quality monitoring on IT systems in production: 2016 — 44%
- We use automated test data generation: 2016 — 43%
- We use service virtualization of test environments: 2016 — 43%, 2015 — 51%
- We use automated provisioning of test environments: 2016 — 42%, 2015 — 43%
- We use test automation integrated with continuous integration (CI) techniques: 2016 — 42%, 2015 — 47%

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Challenges in setting up the Agile TCOE

Legend: 2016 | 2015

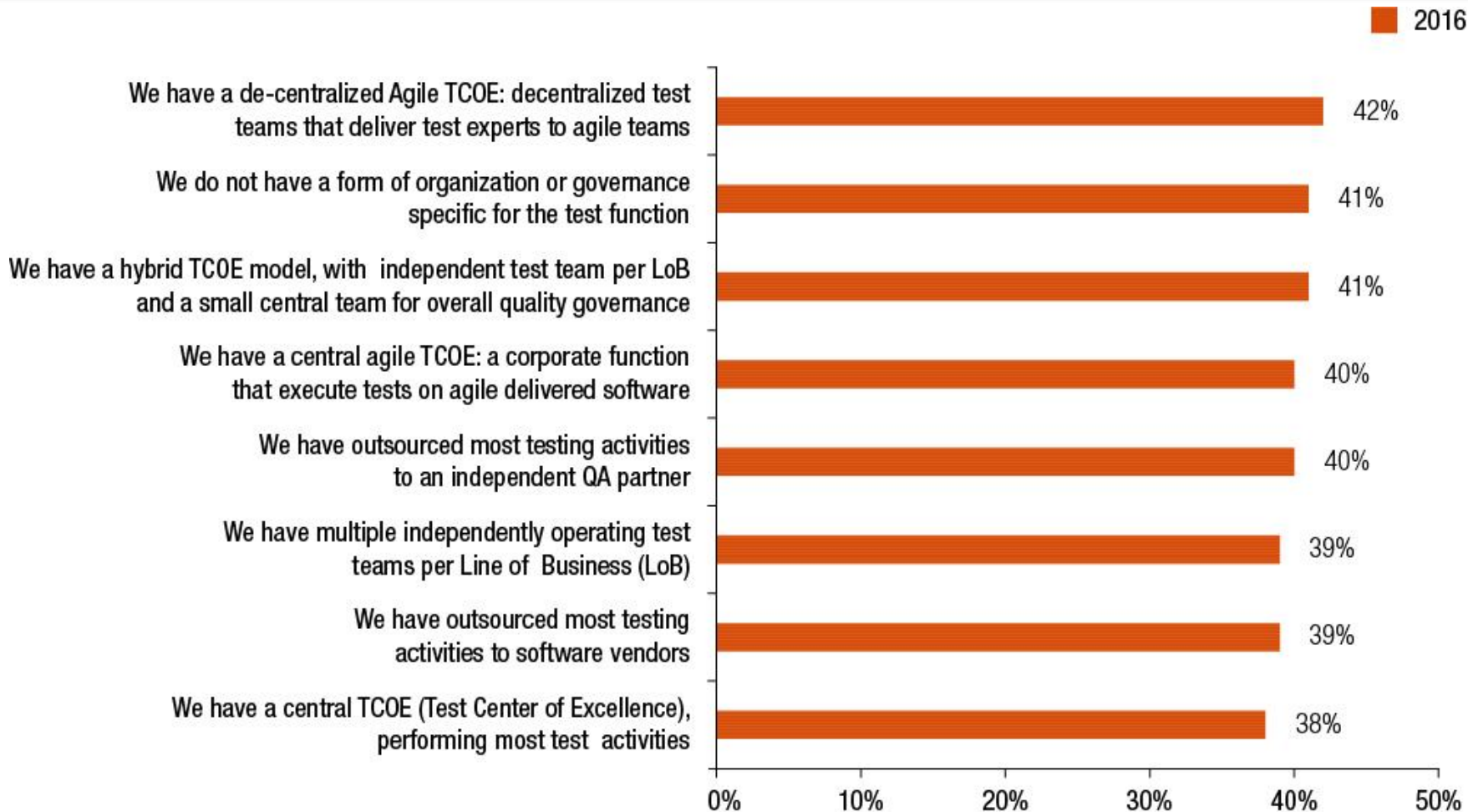| Challenge	2016	2015
Necessity to co-locate teams, denying cost savings through globally distributed delivery models	46%	41%
Independent Testing Vendors lack of willingness toward 'pair programming' with development teams	45%	36%
Agile being used as an excuse to not develop documentation resulting in low quality applications	44%	45%
Emergence of new testing tools which needs development skill sets	43%	
Traditional test design methods used that are unsuitable for agile delivery models	43%	42%
Testing teams not being as agile as development teams	42%	42%

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Industrialization and TCoE

Entering the era of intelligence led testing

Organization of testing activities

Legend: 2016

Statement	2016
We have a de-centralized Agile TCOE: decentralized test teams that deliver test experts to agile teams	42%
We do not have a form of organization or governance specific for the test function	41%
We have a hybrid TCOE model, with independent test team per LoB and a small central team for overall quality governance	41%
We have a central agile TCOE: a corporate function that execute tests on agile delivered software	40%
We have outsourced most testing activities to an independent QA partner	40%
We have multiple independently operating test teams per Line of Business (LoB)	39%
We have outsourced most testing activities to software vendors	39%
We have a central TCOE (Test Center of Excellence), performing most test activities	38%

Test Automation Challenges

Legend: 2016

Challenge	2016
We don't have the right automation tools	45%
Challenge with the Test Data and Environment Availability	40%
Delivery methodology doesn't support test automation	35%
We have difficulties to integrate the different automation tools together	37%
Application functionality changes too frequently	36%
We don't have the right automation testing process/method	35%
Lack of stability of test script	34%
Lack of skilled and experience test automation resources	34%
We have difficulties to automate because of use of multiple development lifecycles	32%

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Test Automation Benefits

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Emerging Automation Techniques
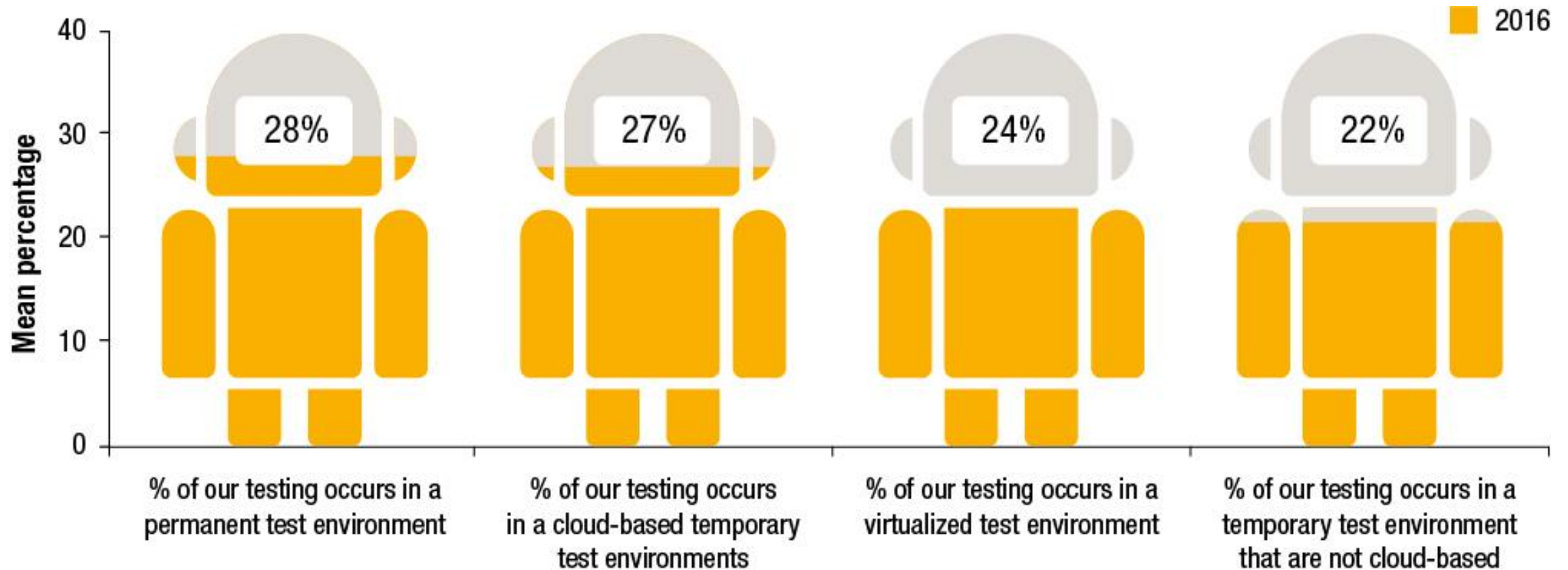
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Test Environment and Test Data Management
Key enablers for quality in DevOps

Main recommendation

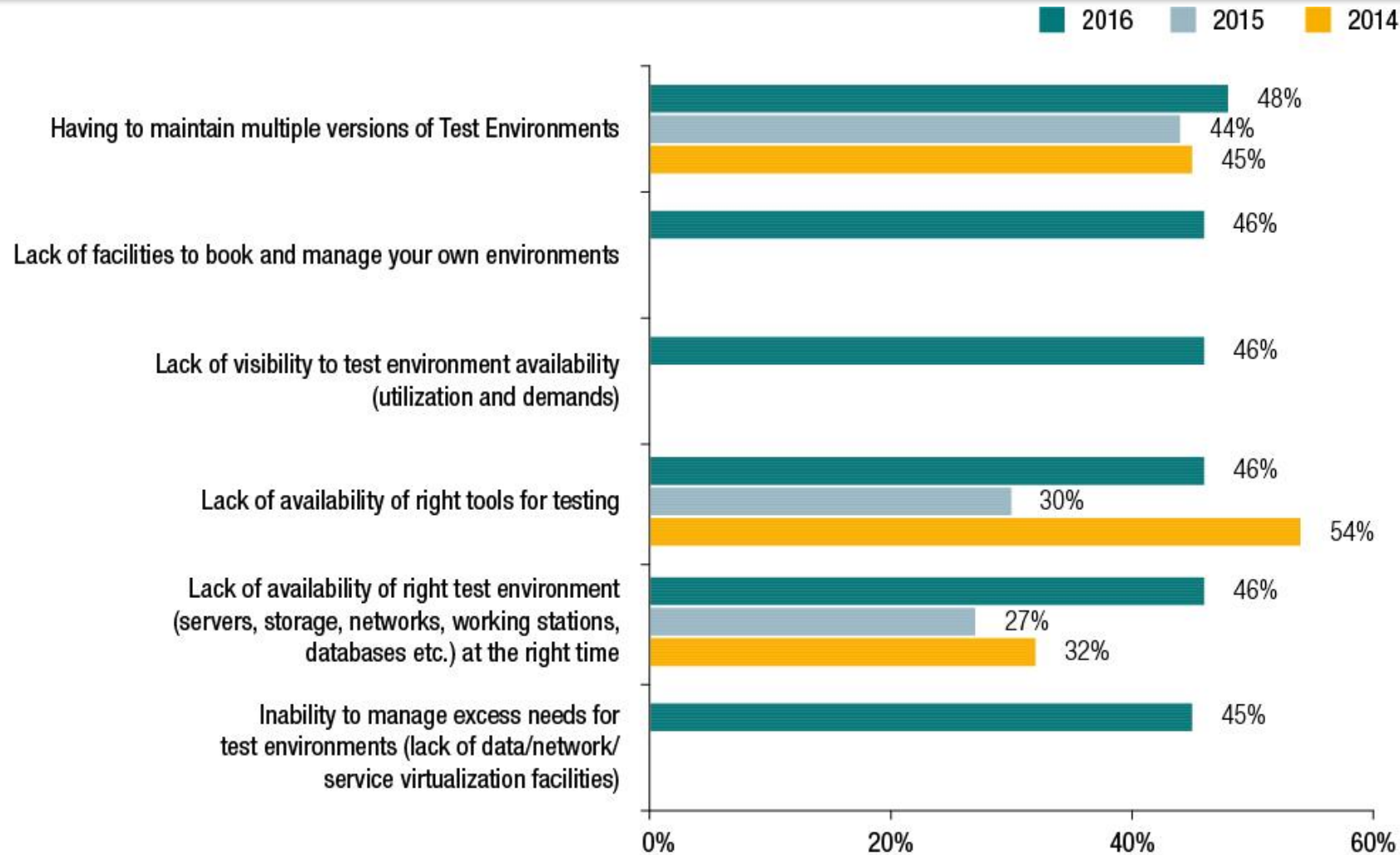## As-a-service solutions for Test Environment and Test Data Management

Test Environment Types

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Challenges with Test Environment Provisioning
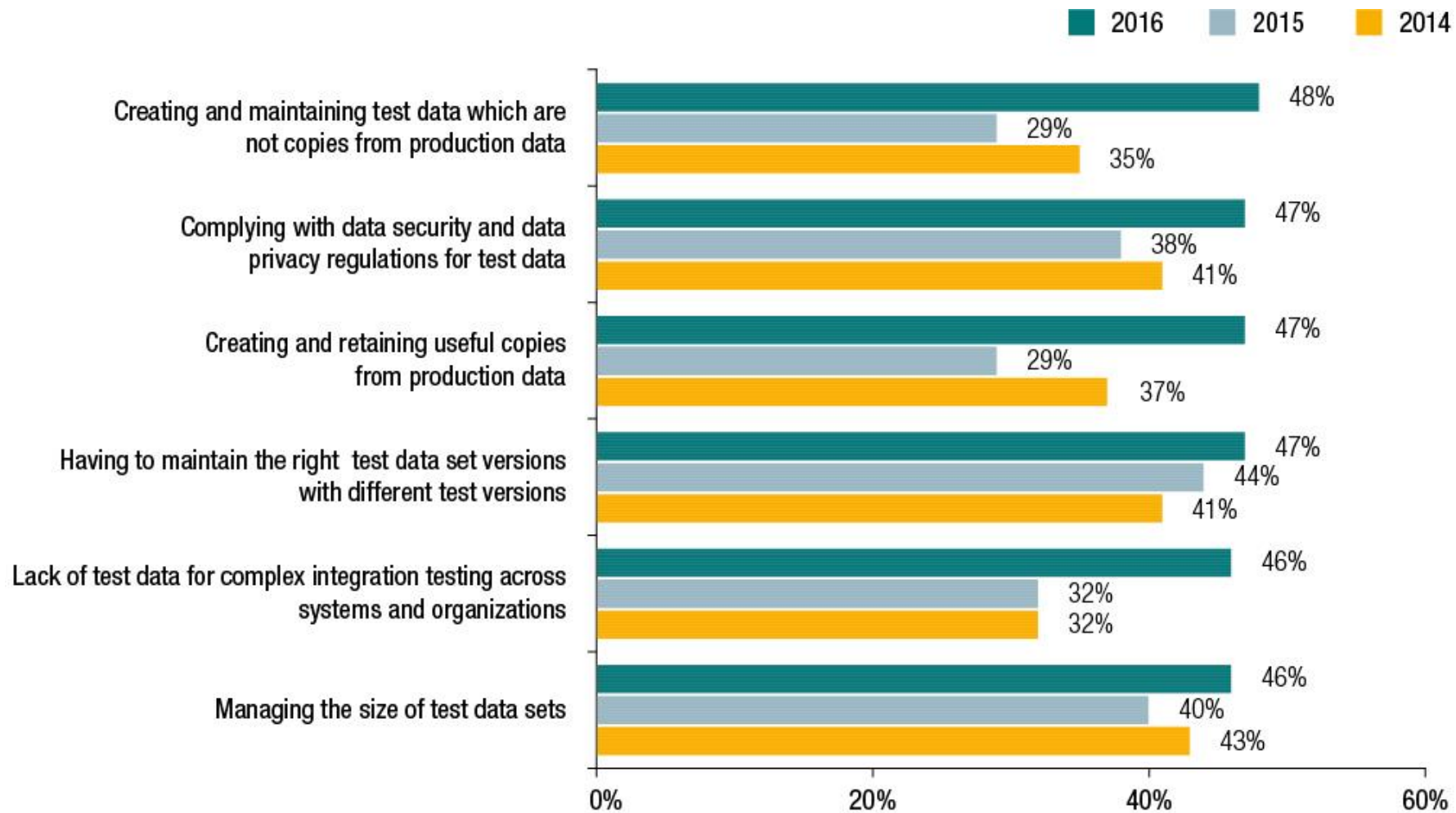

Legend: 2016 | 2015 | 2014

Challenge	2016	2015	2014
Having to maintain multiple versions of Test Environments	48%	44%	45%
Lack of facilities to book and manage your own environments	46%		
Lack of visibility to test environment availability (utilization and demands)	46%		
Lack of availability of right tools for testing	46%	30%	54%
Lack of availability of right test environment (servers, storage, networks, working stations, databases etc.) at the right time	46%	27%	32%
Inability to manage excess needs for test environments (lack of data/network/service virtualization facilities)	45%		

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Challenges in managed test data

Legend: 2016, 2015, 2014

Challenge	2016	2015	2014
Creating and maintaining test data which are not copies from production data	48%	29%	35%
Complying with data security and data privacy regulations for test data	47%	38%	41%
Creating and retaining useful copies from production data	47%	29%	37%
Having to maintain the right test data set versions with different test versions	47%	44%	41%
Lack of test data for complex integration testing across systems and organizations	46%	32%	32%
Managing the size of test data sets	46%	40%	43%

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QA and Test budgets

Getting a grip on test spending

Main recommendation

QA dashboards

Budget allocation as percentage of IT spend

Aspects impacting the increase of QA and Testing budgets

Legend: 2016

Aspect	2016
Increased amount of developments and releases	52%
Shift to agile and DevOps causing more test iteration cycles	41%
Increased challenges with test environments	36%
Business demands higher IT quality	33%
We detect more defects which leads to more/longer test cycles	31%
Increased inefficiency of test activities	29%
More non-functional testing required	24%
Increased complexity of IT applications	20%

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Split of QA and Testing Budgets

Summary

- Digital transformation drives IT strategy and influences the QA and testing function

  - Intelligent QA and Test Platforms

- Emergence of IOT functionality has the potential to increase the impact of failure

  - IoT test strategy

- Agile and DevOps continue to grow in adoption, with QA making a corresponding move

  - QA enablement for DevOps

- Test environment management challenges are growing

  - As-a-service solutions for Test Environment and Test Data Management

- Finding efficiencies at every level in QA and Testing

  - QA dashboard

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Questions & Answers

About Capgemini and Sogeti

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Sogeti is a leading provider of technology and software testing, specializing in Application, Infrastructure and Engineering Services. Sogeti offers cutting-edge solutions around Testing, Business Intelligence & Analytics, Mobile, Cloud and Cyber Security. Sogeti brings together more than 23,000 professionals in 15 countries and has a strong local presence in over 100 locations in Europe, USA and India. Sogeti is a wholly-owned subsidiary of Cap Gemini S.A., listed on the Paris Stock Exchange.

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