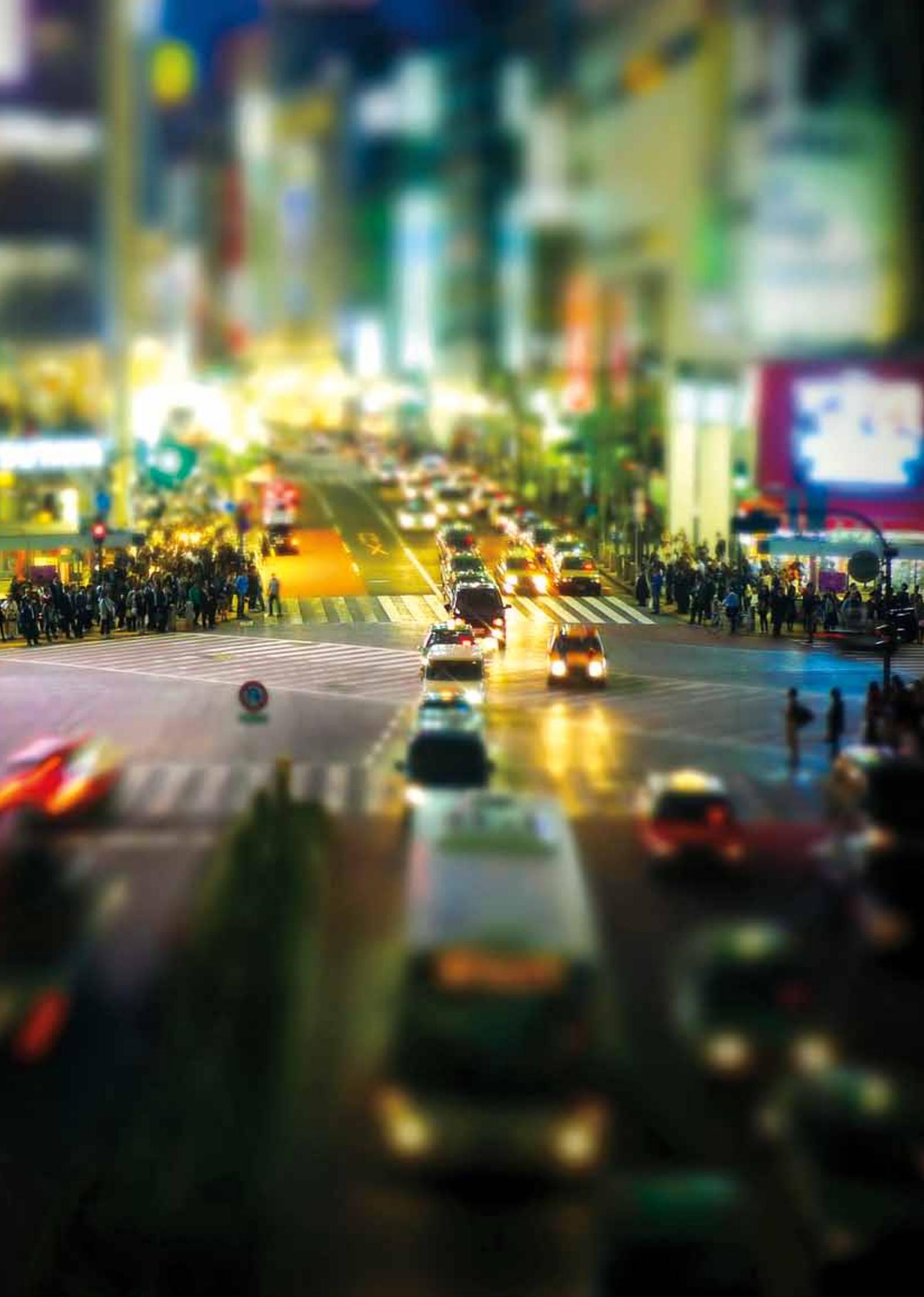


FOURTH EDITION  
2012-13

# WORLD QUALITY REPORT





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# INTRODUCTION

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**Michel de Meijer**

Senior Vice President, Leader Global Service Line Testing, Capgemini & Sogeti



**Matthew Morgan**

Vice President, Hybrid IT and Cloud Product Marketing, Software, HP

Welcome to the fourth edition of the *World Quality Report*, which, as in previous years, has been designed to provide the most comprehensive assessment of the current state of enterprise application quality and testing practices available from around the world.

To enhance the quality and relevance of the data gathered, we increased the number of interviews to more than 1,550 CFOs, CIOs, IT directors, and quality assurance (QA) directors around the globe, all of which were carried out by phone. We also broadened our geographical sample, focused more intently on the 'enterprise' market, and included additional questions reflecting the significant changes in our technology landscape, such as the almost ubiquitous uptake of mobile communications.

Changes taking place in the IT market increasingly require scalable, robust, and reliable applications and infrastructure. Further, the disruptive effects of cloud computing adoption, increased mobility, and device proliferation require organizations to develop applications that can seamlessly interface with an ever-broader range of distribution channels and routes-to-market. Our research is evidence that a focus on quality management is increasingly regarded as a strategic value.

While this year's research confirms many of the trends from previous editions of the *World Quality Report*, there are also a

number of new emerging developments in the market and an increased pace of change. For example, since last year, many readers will have seen corporate announcements about a growing number of large-scale enterprise-wide managed testing service contracts being awarded, and an increased uptake of Testing as a Service (TaaS) solutions.

Similarly, many organizations are looking to develop Testing Centers of Excellence (TCOEs), which use a standardized testing methodology, best practices, and tools, together with a flexible pool of professional resources to ensure high levels of quality and risk mitigation across all applications.

Over the last four years, the *World Quality Report*, published by the Capgemini Group and HP, has established itself as the largest annual survey of application quality and testing practices, with a growing reputation as a valuable benchmark for organizations around the world. The report is the result of close collaboration between Capgemini, Sogeti, and HP, both leaders in our respective fields of outsourced testing and Application Lifecycle Management

tools, services, and products developed to improve the efficiency and effectiveness of enterprise applications.

We hope you find that the research, analysis, and commentary contained in this year's report both informs your own testing and quality assurance decisions and perhaps challenges some of your current thinking. We also value your comments and ideas, and invite you to contact either of us or any of the contributors to this report regarding any question you might have concerning testing and quality assurance.

Finally, we would like to thank all of the individuals who participated in the research and gave generously of their time. Without them, it would not have been possible to produce the *World Quality Report 2012-13*.

You can also reach us by sending an email to: [worldqualityreport.s.uk@capgemini.com](mailto:worldqualityreport.s.uk@capgemini.com) or [worldqualityreport.s.uk@sogeti.com](mailto:worldqualityreport.s.uk@sogeti.com)

# EXECUTIVE SUMMARY

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This is the fourth year that Capgemini, Sogeti, and HP have produced the *World Quality Report*. Our aim remains to examine the current trends in enterprise application quality across different industries and geographies for the purposes of providing actionable insight for decision making. Our hope is that readers will learn from our report and apply their new understanding to improve the effectiveness of Quality Assurance (QA) and testing within their own organizations.



Our global survey was carried out against a challenging economic landscape for organizations of all sizes and sectors. Many countries continue to experience low, stagnant, or negative rates of economic growth, and many governments have applied harsh austerity measures aimed at reducing public expenditure. Some sectors, particularly public and financial services, are under greater scrutiny to get IT right the first time and ensure improved value for money. Social media and the speed by which information is exchanged are also changing the way consumers and providers of applications interact with one another. Consumers of applications enjoy an enhanced scrutiny over service providers, whereas the providers are looking for ways to respond to the resulting pressure, while also keeping an eye on a potential market uptick.

We have focused our research on the impact of this complex environment on testing and QA, a discipline that is itself also undergoing a series of technological and cultural changes.

### **RAPIDLY EVOLVING IT LANDSCAPE NECESSITATES INNOVATION IN THE QA DISCIPLINE**

Quality Assurance is undergoing a quiet but steady evolution from in-house testing generalists to a structured and efficient discipline, with a greater influence within the overall application development lifecycle. We observe from our survey the emergence of a multifaceted discipline with an increasing range of operating models at its disposal, that enables a streamlined and cost-effective output that is also aligned with business needs.

The level of QA and testing investment has proved to be resilient in adverse economic environments in most markets, and has stretched to accommodate an ever-increasing workload. But now testing resources need to prove themselves more



**Murat Aksu**

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effectively and QA teams need to stay alert to the new disruptive technologies and ensure their skill levels are attuned to both market and internal expectations. We explore these findings in more detail below.

### **HAS QA BEEN CAUGHT OFF GUARD BY MOBILITY?**

As mobile adoption has become almost ubiquitous in developed markets, the business imperative for mobile business is clear. But our study indicates that speed of adoption and proliferation of handheld devices, coupled with use of social media, seem to have caught enterprise testing by surprise. Organizations may not be giving mobile the priority it warrants. Only 31% of respondents across the world currently test mobile applications – a figure that does not deviate much from region to region, and those surveyed readily admit to being ill equipped for mobile testing. This suggests that QA has fallen behind the mainstream mobile curve.

Reasons given are multiple: many report that they don't have the ability to test or effectively certify mobile applications because of the lack of appropriate tools, processes, or expertise, and limited access to the necessary devices. Moreover, the focus is firmly on efficiency of performance, cited by 64% of firms, rather than functionality, usability, or security. Overall, this argues for an underestimation of the infrastructure challenges posed by the mobile era, or an inability to address them.



**Charlie Li**

Co-Author of *World Quality Report*  
Vice-President, Global Service Line Testing  
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As today's mobile users – customers and employees – expect interaction at their fingertips, anytime, anywhere, making a business mobile and “always on” should be higher up the corporate and IT agenda.

### **NEW OPERATING MODELS SUCH AS CLOUD-BASED MODELS AND TESTING CENTERS OF EXCELLENCE HAVE COME OF AGE**

Cloud-based models for testing have had a relatively slow adoption rate, but evidence from our study of sustained wider-scale adoption and falling barriers indicates that organizations are on the verge of much more extensive use. Testing in a cloud environment, for example, is growing at a healthy rate. Some 28% of our respondents currently use this infrastructure model, a proportion forecast to rise to 39% by 2015. Moreover, only 4% say that they will not use the cloud in some way over the next three years, down from 31% only two years ago, a clear indication that testing in the cloud is set to become a new norm, as issues surrounding cloud, such as security, are addressed.

Equally significant is the adoption of other cloud-based services. Software as a Service (SaaS) continues to grow; almost a third (31%) of firms' testing software is currently provided on a SaaS basis – up from 25% last year, and by 2015 we predict that almost half of firms will use the on-demand model.

Testing as a Service (TaaS) – which can be a combination of cloud-based testing environment and tools, and on-demand test execution – is a cost-effective operating model for ad hoc quality projects and also for longer-term testing provisioning that demonstrates similar rates of adoption. We found that 78% of respondents are planning to move to TaaS in the next two years, rising to 89% by 2015. This rapid take-up of TaaS is fueled by cost-reduction drivers and its flexibility as a complementary model to more comprehensive outsourcing or in-house Testing Centers of Excellence (TCOEs). So while some still see the security of the cloud as a continuing threat, their numbers are dwindling as the advantages more clearly outweigh the drawbacks.

For TCOEs that have been underutilized in the past, their time too has arrived. Undoubtedly an efficient approach to industrializing testing activity, TCOEs act as a virtual command center, using a standardized approach and a flexible pool of available resources. Our data reveals that, this year, 60% of respondents plan on – or are – developing a TCOE, up from 45% last year. In our experience, we see the concept is now sufficiently advanced and its benefits more clearly understood: a TCOE enables organizations to meet the challenges of the business – speed-to-market and doing “more for less” – head on.

### CAN WE PUT A PRICE ON QUALITY?

Technological innovations and initiatives are increasing the workload for ever-stretched QA teams, but the corresponding QA and testing budgets appear to be weathering the economic storms. In 2011, these budgets were not supporting the challenges faced in the marketplace, but this year’s survey finds testing budgets growing at a stronger rate than last year, with 42% reporting that budgets had risen over the past 12 months. While 18% forecast a fall when looking ahead to 2015, some 53% optimistically expect budgets to rise, indicating a new degree of confidence that the business is more committed to investing in QA.

Moreover, the focus appears to have shifted from “business as usual” tasks to investment in transformational work, to drive enhancements, and 59% of the budget is now spent on customer-facing applications. So priorities

are changing to support the core areas of the business that will require an optimized platform for efficient delivery of testing, which we regard as a positive step.

For the first time, the *World Quality Report* has established a worldwide benchmark for testing hourly rates, internally and externally. Firms are paying a global average hourly rate of around \$55 per hour for in-house testers, compared to \$53 for external support – a differential of \$2 per hour. Obviously, rates vary greatly from region to region and can be affected by the scarcity of available skills in local markets. Does this represent the price of quality? Only an individual business can make that decision, when evaluated against other prime resources.

### CONFIDENCE IN QA RESOURCES IS A CONCERN

While budgets might be in reasonable shape, confidence in testing resources is not resounding. A majority of organizations characterize their internal teams as “average” at best, in their knowledge of core testing processes and methodologies, and not necessarily up to speed with the latest testing tools and technologies. Their assessment of external testers is slightly better, with a third of organizations scoring their external testers’ knowledge and abilities as “above average”. But less than 5% of firms are fully confident that their testers (internal or external) are “best in class”. Despite initiatives and investment, especially over the last decade or so, there are clearly lessons to be learned in terms of either real or perceived quality of output for both providers and users of QA.

Simply put, as the competitive landscape forces organizations to update and optimize their testing resources and drive down costs and time-to-market, the overall quality of testing resources needs to keep pace or change, to satisfy or exceed the perceived and increasingly complex requirements of organizations in the future.

### THE EMERGENCE OF A MORE GLOBAL AND UNIFORM INDUSTRY

In our previous surveys, we have focused attention on the differences between the major countries or regions surveyed. This year we notice that while variances still

exist, there is a greater harmonization, with fewer major differences evidenced across the globe, at least within the enterprise markets. One example is that the proportion of an organization’s software development lifecycle budget that is invested in testing, averaged across the regions, is 18%, with remarkably few regional variations.

Our perspective is that testing is becoming less of a regionally facing discipline and that, led by globally active companies, the gap between emerging markets and more traditionally mature markets is narrowing. This is no doubt a reflection of the rapid investment in skilled resources and tools, led by India, that has taken place in offshore and nearshore countries – China, South East Asia, South America, and, more recently, Eastern Europe, Central America, and parts of Africa. All point to testing emerging as a more uniform global discipline.

### WORLD QUALITY REPORT RECOMMENDATIONS

For providers and users of QA and testing, we offer these suggestions on how to apply the findings of this year’s *World Quality Report*.

#### QA needs to be a formalized step in the application lifecycle

While QA’s status within the IT organization has improved compared to a decade ago, we still see instances of the testing function being considered as an afterthought or viewed as a roadblock preventing an application from being deployed to production. IT can only be as agile or efficient as its weakest component.

As IT continues to reinvent itself with new processes, paradigms, and platforms, these innovations rarely include aspects of QA. The fact that testing is not being brought along the journey of reinvention often results in QA being the bottleneck. Organizations need to understand the critical role of QA in the application lifecycle and treat it with the same respect as its peers.

#### Mobility should become fully integrated into testing priorities

We were surprised by the relatively low level of proactive structured testing in this increasingly essential area of business connectivity. We believe that



mobile testing needs to be a fully integrated element of the QA discipline, so that the mobile strategy of the enterprise takes testing into account right from the start. The strategy should consider the objectives of the business owner, how the mobile app is delivered, and the target user for the app whether that be customers, suppliers, or employees. Organizations need to accept the paradigm shift brought about by mobility and embrace the new notion of quality for mobile apps, which is a departure from traditional standards applied to desktop applications.

No doubt, standardization of devices will ease the complexity over time, but in the short term, proliferation of smartphone and mobile devices, the roll-out of 4G, and use of social media will only continue to exacerbate the situation. As will the need to focus on the user experience and functionality testing as well as performance. If organizations are to turn the mobile opportunity into a business advantage, some will need to “skill up” or “skill out”.

#### **Evaluate the breadth of cost-effective operating models to see if it is a good fit**

In the quest for greater testing maturity balanced against return on investment, organizations have an increasing array of operating models from which to choose to achieve their goals. Companies should first define the business goals they wish to achieve and then evaluate the myriad of models against these objectives. Each model has its advantages and shortcomings,

and corporate culture, appetite for risk, and need for control versus flexibility all play a part in determining whether a new operating model should be adopted and which one.

On the journey from in-house testing generalists and developers to a professionalized discipline wanting to adopt “Shift Left” principles that embed QA earlier in the traditional software development lifecycle, organizations should critically appraise their current set-up and review how testing in a cloud environment, cloud-based TaaS, and TCOEs can provide those critical incremental efficiency and quality improvements.

#### **Pay closer attention to demonstrating QA’s business value for the money**

Value for money is, of course, subjective, but what does constitute a good return on your QA investment? One measure is investment in QA/testing as a proportion of the total IT budget, averaging at 18% across the world. Below 18%, organizations should examine if they are investing enough to achieve or sustain the quality required. Those spending more should review their operational efficiency.

But more precisely, companies need to establish specific measures to evaluate the return on their overall investment, and testing departments and service providers need to act “smarter” in their use of tools, models, and communication to stakeholders to demonstrate the business value they provide in order to justify the proportional spend on QA.

#### **Re-evaluate the diversity of skills required**

The perceived quality of testing resources has a bearing on value for money, and the unexceptional assessment of ability needs examination. Over time, we expect that businesses will be even more exacting in their expectations of any and all testing resources when it comes to complex business-critical applications. All providers, in-house, contract, and external, should take notice.

QA has made great strides in becoming a professional discipline with a distinct career path and specific skills. But this is a moving target; testing training at the individual and team level needs to keep pace with the fast-changing landscape, and should be properly funded, rather than being sacrificed under the pressure of deadlines.

Budgets are currently at a strong level, a clear recognition of the value of the testing function to the organization, yet this is in contrast to the perceived value of the actual resources. This gap can certainly be bridged by clearly targeting those skill areas that are essential to the business.

#### **CONCLUSION**

Our findings in this report indicate that QA continues to make steady progress on repositioning itself further up the business value chain on the journey of reinvention, emerging from the shadows of development teams to a value-for-money and mature discipline. Looking ahead, we anticipate further strides in the adoption of “Shift Left” initiatives and greater use of new models such as crowd sourcing which leverages knowledge and manpower from an undefined pool of resources, to improve value-for-money ratios and timelines. But greater improvement will not come about without significant investment – not only financially, in terms of budgets and skills, but also culturally.

But organizations will need to exert firm but flexible control to work across a wider range of delivery models and technologies. Budgets will need to work harder to effect the changes required to respond to a range of demands from time-to-market, cost efficiency, and improved quality. And QA will need to keep up with market expectations, remaining focused on providing real, measurable business value.

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# THE STATE OF QUALITY 2012



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**12** **Quality Budgets:** Stepping up

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A growing priority

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# QUALITY BUDGETS: STEPPING UP

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“INVESTMENT IS GOING TO BE FOCUSED ON THOSE ELEMENTS THAT SUPPORT OUR WIDER BUSINESS OBJECTIVES, AS THERE IS A NEED FOR [TESTING] AND THE BUSINESS SIDE TO BE MUCH CLOSER. DECISIONS NEED TO BE MADE MORE QUICKLY AND PRODUCT DEVELOPMENT TIME IS SHRINKING – WE NEED THE TOOLS AND SKILLS TO BE ABLE TO ANSWER THAT NEED.”

A TELECOMMUNICATIONS BUSINESS,  
THE NETHERLANDS

Organizations are trying to balance market uncertainty with the need to position for eventual growth, as well as tackling the challenges of social media and mobile technologies. At the operational level, a complex web of factors is forcing organizations to update and optimize their testing resources and internal processes to drive reduced time-to-market and lower costs, as well as improve quality using new beneficial delivery models, such as cloud and TCOEs.

As a result, the QA function and QA budgets, in particular, are under the spotlight, because to achieve these stretch business targets, organizations need to leverage their QA capabilities more effectively. This requires a step-up in investment over the short and medium term, even in times of economic uncertainty.

Indeed, this year's survey finds testing budgets are expanding at a healthier rate than the incremental upturn seen in 2011-12, when growth was failing to keep pace with an increasing workload, due to cost-cutting measures. This positive step points to a desire among businesses to invest for the future and meet internal and external demands quickly and effectively.

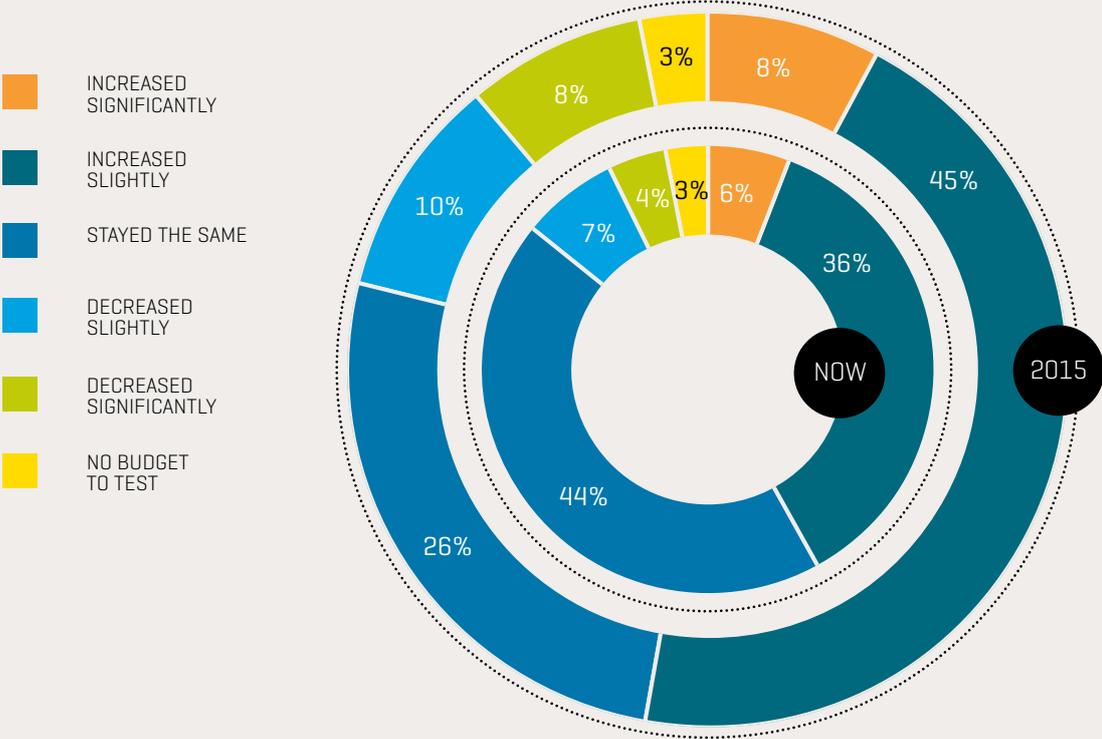
## AN UPWARD CURVE

In general, the survey provides good news regarding QA budgets, given the economic backdrop. Close to half (42%) of QA budgets have increased over the last year, with only 11% reporting a decrease. The greatest proportion (44%) saw no movement either way, but in a time of uncertainty, maintaining the same level of investment in the quality function is, in itself, a testimony to the importance of QA to the organization. Overall, this is perhaps a more positive situation than might have been predicted.

Moreover, this upward curve is expected to continue over the coming three years, indicating a degree of optimism. A healthy majority (53%) expect their budgets to rise between now and 2015, while just a fifth (18%) forecast a fall. This seems to be a universal trend with little variation by region or sector.

CHANGE IN TESTING BUDGETS FROM LAST YEAR, AS COMPARED TO NOW AND IN 2015

FIGURE 1



Base: 1553 Respondents

The majority of organizations expect testing budgets to rise between now and 2015



### INCREASING PRESSURE TO DEMONSTRATE RESULTS

Budgets may be on the upward trend, but there is no room for complacency. An increase in investment will intensify the focus on QA productivity, a function that is viewed primarily as a necessary cost base.

Even as testing spend rises, companies still need to maintain downward pressure on costs, as the move to consolidation in TCOEs and on-demand testing via the cloud both illustrate. Any investment needs to achieve a return, which means that continued or intensified scrutiny by the business units who pay for QA services is likely, in order to ensure that new testing resources are optimally deployed and managed.

One way to ensure budgets are being spent productively is to effectively measure the added value of testing and clearly communicate this to the business stakeholders. The good news is that only 15% of organizations do not have a process to consistently collect and present their quality KPIs to the business. The vast majority of organizations are collecting this data using QA management or business intelligence products in the market, or using common office applications such as Microsoft Excel. In fact, 56% indicate that they automatically gather and share metrics using Excel, and

21% collect data manually and use Excel as a presentation layer. However, while Excel is universally available and a low-cost solution, it does not support the richness in functionality that a professional reporting and QA management product can provide. In times of greater business scrutiny, QA organizations' best interests will be served by providing constantly updated business KPIs that track return on investment.

### THE MAGIC NUMBER FOR QUALITY BUDGETS

Testing budgets tend to average out at around 18% of total spend on organizations' software development lifecycle, and this figure seems to extend across all global regions and industry sectors surveyed. On balance, this would seem to be the benchmark proportion of the software development budget that organizations need to commit to testing.

Spending much below this level runs the risk of developing applications that are inadequate from a quality perspective, or applications that are outdated before their release when the QA process takes too long to bring a product to market ahead of the competition. Spend too far above this level, and organizations may need to question the efficiency of their QA operations, or ask whether the additional spend is justified because the superior application quality contributes

to a commercial competitive edge, or because it needs to meet highly stringent governmental regulations or safety requirements, e.g. public transportation systems.

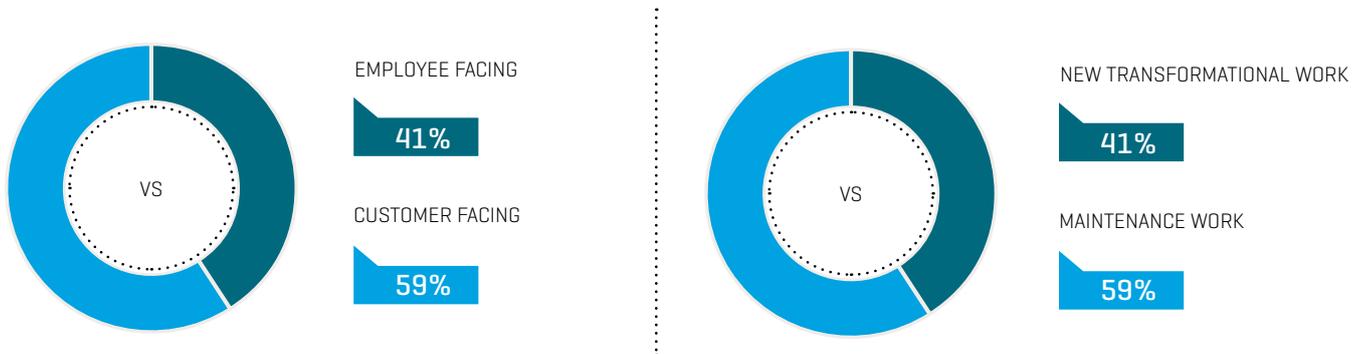
### INCREASED FOCUS ON EXTERNAL ACTIVITIES

The areas in which testing investment is being focused reflect the competitive pressures organizations feel in an unpredictable climate. A robust two-fifths (41%) of testing spend is being dedicated to transformational work – testing new applications, as opposed to maintenance of existing software. This is a positive indication that, even amid continued global economic turbulence, firms are continuing to invest in developing new products and services.

Similarly, the greater proportion of testing budgets (59%) are being spent on customer-facing applications rather than on internal organizational applications (41%), a clear focus on external applications that have a direct impact on sales and revenue growth. Firms are also boosting their investment in TCOEs in order to compress the time-to-market for new products. Companies, no matter what sector or region, are investing in innovation in order to maintain and capture market share and ultimately drive revenue.

### SPEND ON EMPLOYEE- VERSUS CUSTOMER-FACING APPLICATIONS, AND TRANSFORMATIONAL VERSUS MAINTENANCE WORK

FIGURE 2



Base: 1,221 respondents

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A MANUFACTURING  
BUSINESS, CZECH  
REPUBLIC

“THE PROBLEM IS INCREASING PRESSURE TO GET THINGS DONE YESTERDAY. WE HAVE THIS CONFLICT BETWEEN TESTING ADEQUATELY TO OUR SATISFACTION AND THE TESTING TIME EXPECTED BY THOSE ON THE [BUSINESS] SIDE. INVESTMENT HAS INCREASED BUT THEN EXPECTATION IN SPEED OF DELIVERY HAS ALSO INCREASED. IT’S NOT EASY, AS THE ORGANIZATION NEEDS TO BE ABLE TO JUMP INTO A MUCH FASTER TESTING MODE WHILE MAINTAINING QUALITY STANDARDS.”



“MY INVESTMENT GOING FORWARD WILL [FOCUS ON] BRINGING MY INTERNAL TEAMS UP TO STANDARD, INCREASING THE LEVEL OF AUTOMATION USED, AND DEVELOPING GREATER EFFICIENCIES THROUGHOUT. ALTHOUGH OUR TESTING BUDGET IS NOT SEPARATE FROM THE WIDER IT BUDGET, THE LEVEL OF MONITORING AND PERFORMANCE MEASURING HAS INCREASED – WE NEED TO JUSTIFY OUR COSTS.”

AN AUTOMOTIVE BUSINESS, BRAZIL

**INVESTMENT PRIORITIES:  
CURRENT AND FUTURE**

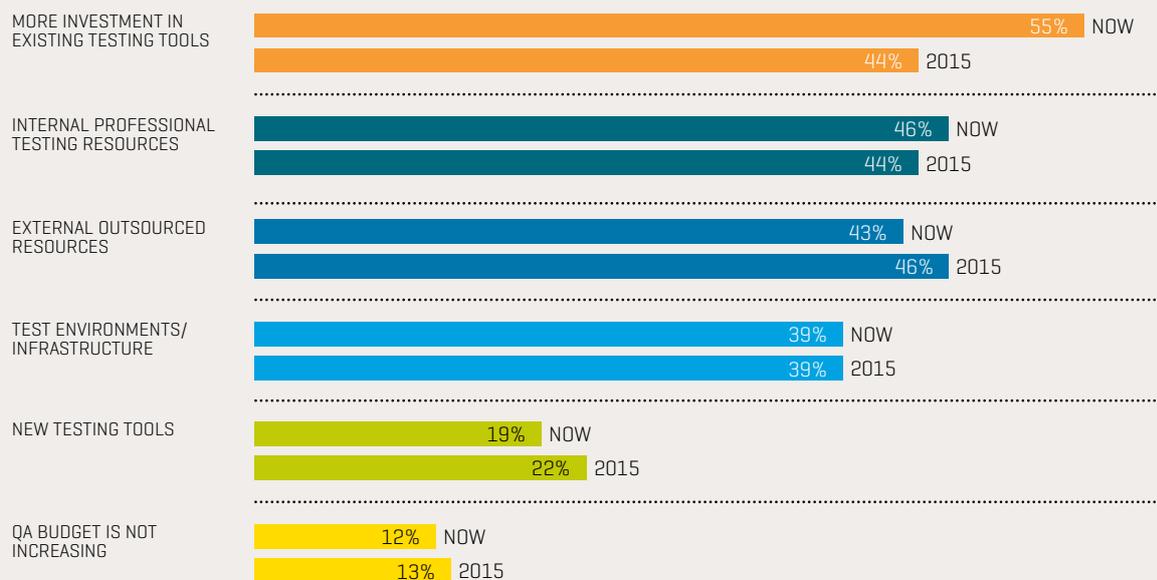
QA investment priorities are largely shaped by the new market landscape where organizations must achieve more with fewer resources, find ways to reduce cost, and deal with increased competition from both bricks-and-mortar and online channels.

As a result, organizations are seeing an imperative to upgrade existing suites of testing tools. More than half (55%) of respondents describe the upgrade process as the budgetary line item receiving the greatest increase in spend, and in our opinion this is driven by a desire to move to newer application lifecycle platforms and software-on-demand type models.

Looking ahead to 2015, however, priorities are set to shift from upgrading existing tools to buying external resource support. A smaller proportion (44%) of firms still expect existing tools to be their number one investment focus three years from now, but it is secondary to purchasing external resources to supplement their internal QA team (46%).

**AREAS OF GREATEST INCREASE IN SPEND: NOW AND IN 2015**

FIGURE 3



Base: 1553 Respondents

New product development will generate the need for new testing skills, tools, and devices, prompting organizations to seek support from external partners. Investment in new testing tools will also rise, as new products and services are introduced to the market. Some 22% see this as the top spend priority for 2015, up from 19% at present.

## BUDGETS RELATIVELY CONSISTENT ACROSS REGIONS

The greatest degree of consensus between global regions in this year's report is around QA budgets. Budget levels hover consistently around the all-sample mean of 18% of total software development spend across all but one of the geographic areas surveyed. The exception is South America, where testing takes up some 25% of the budget.

We believe that this is an indication of targeted South American investment. As Brazil, in particular, continues to boom economically and expectations around application needs are raised, so testing investment is being enhanced.

The pattern is similarly consistent for budget increases, with the exception of Asia. Asian firms appear to benefit from the most aggressive budget expansion compared to other regions, as was the case in 2011. Half of Asian respondents saw an increase in budget from last year, compared to the global average of 42%. More still (60%) expect an increase over the next three years, against an average of 53%.

The balance of spend between new and maintenance work also presents a fairly uniform picture. Here again, South America is the outlier, where firms are spending almost half (48%) of testing budget on transformational work (average 41%).

The same goes for the split between spend on customer- and employee-facing applications. South America again goes against the global trend, being the least externally focused region, spending only 52% on customer applications (compared to 59% on average).

## INVESTMENT PRIORITIES VARY BY REGION

When it comes to investment priorities, there are greater variations between the regions. Eastern Europe currently has invested far more in new testing tools (33%)

when compared to other regions and to the global average (19%). The Nordics and North America are at the other end of the scale, with just 15% of firms giving top priority to buying new tools, although both regions indicate a focus on upgrading existing tool sets, which might suggest that they are looking to better leverage their shelfware and make their existing investments go further. Southern European firms are more heavily focused on upgrading existing tools (63% compared to 55% on average), perhaps suggesting that they are maturing from a more manual-intensive process to incorporate automation.

Looking ahead, Southern Europe will be increasing its investment in outsourced testing, with a majority (57%) of firms in this region viewing this as their main QA investment priority for 2015, compared to 46% overall. Just over half of respondents in the UK and Ireland, North America, and Eastern Europe also expect external suppliers to receive the lion's share of their testing spend three years from now, further evidence that the global move towards outsourcing will continue to grow.

## PUBLIC SECTOR LEADS THE WAY FOR INCREASED QA BUDGET

The pattern of uniformity around testing budgets seen between the regions is repeated across the industries surveyed, with QA budgets in most sectors fairly evenly balanced around the average 18% of total software development spend. The greatest disparities are in the Consumer Products, Retail, and Distribution (CPRD) space (22%), reflecting a higher focus on the quality of end-user consumer applications, and Financial Services (FS) at 20%, a traditionally heavy investor in QA.

The Public Sector, surprisingly, is experiencing unexpected budget uplifts at a time when governments around the

world are radically reducing spend to cope with the fallout from the worldwide economic crisis. Almost half (48%) of public organizations' testing budgets increased from the previous year, the highest proportion of all sectors studied, with 56% also predicting an increase between now and 2015.

Our observation is that public bodies are investing in consolidating their testing operations to drive cost efficiencies in the face of austerity. With a lingering legacy of failed major IT projects, QA has to be stepped up to derive more from existing capabilities and improve testing. Investment in existing testing tools is seen as one of the solutions to remedy the failed IT projects issue. Over half (58%) of Public Sector entities identify this as the greatest increase in spend.

Manufacturing firms are the most optimistic among the sectors, anticipating an increase in testing budgets three years from now: 58% expect spend to grow between now and 2015, against a mean of 53%. Although our experience has shown that manufacturing firms tend to spend less on IT overall compared to other sectors, it is an increase nonetheless. Some 30% of manufacturers predict that new testing tools will be the greatest spend in 2015, compared to 22% on average. CPRD firms are similarly optimistic in terms of budget outlook in 2015, with 57% anticipating an increase, and the sector places the highest priority on innovation, committing 45% of spend to new transformational work (all-sample average 41%).

Energy and Utilities (E&U) is an intriguing exception in terms of current investment priorities, spending notably more on both existing (65%) and new (23%) tools, and transportation firms are the most keenly focused on outsourcing. More than half (52%) see this as the fastest rising area of spend, compared to a mean of 43%.

In summary, against a gloomy backdrop of depressed economic activity and relative financial instability affecting most regions surveyed, QA budgets have held their place in the IT overall spend. We believe this is a somewhat late recognition of the inherent value of testing and QA in ensuring robust business-critical applications as an enabler of commercial growth and public reputation.

48%

of public organizations' testing budgets increased last year - the highest proportion of all sectors studied



# TESTING CENTERS OF EXCELLENCE: A GROWING PRIORITY

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Consolidation and standardization are continuing themes for all organizations around the world and the testing function within these companies is not immune to these trends. Aided by the emergence of new delivery models, technologies, and best practices, organizations are looking to streamline the way in which their QA function is structured and run. TCOEs are undoubtedly an efficient approach to industrializing testing activity. They act as a virtual command center that uses a standardized testing methodology, best practices, automation, metrics, and tools, while managing a flexible pool of available resources, both internal and external, to ensure high levels of quality across applications before deployment and during production. TCOEs also provide visibility into the level of quality for any software system or project, helping IT management make deployment decisions based on business risk.

## GROWING FROM A LOW BASE

We found that only 6% of companies around the world have developed QA into a fully functional TCOE. This number is a significant increase, in terms of percentage, from last year's findings (4%), but the single digit number still reflects a long road ahead for companies to universally adopt the TCOE model.

One of the key attributes of a TCOE is a centralized pool of resources that can be leveraged across multiple projects in an organization. We found that close to 70% of organizations still rely on elements of decentralized testing, while more than a quarter (27%) of them describe their testing function as "highly decentralized".

Testing automation, another aspect of a TCOE, is also scarce, with just 32% of test cases supported by automation. These figures indicate that companies continue to perform QA as siloed projects with minimal opportunity for standardization and sharing of best practices across the enterprise. Of note, the greater proportion of automated testing is conducted offshore, a testament to the growing confidence in moving this type of testing beyond national borders, with only 40% being performed onshore.

Flexible resource pools that can ramp up and down with the changing needs of the company is another attribute of a TCOE. Our research shows that the majority of organizations (51%) still run testing as an in-house function, and only 13% have moved to a service fully managed by an external provider. With the exception of North America, QA organizations have yet to truly embrace the cost benefits of offshoring. The majority of testing resources (52%) are still based on home territory.

Reasons for this global discrepancy vary from region to region. In South America, government-imposed customs taxes and new rules governing the use of offshore services discourage the use of this flexible pool of resources. In Europe, particularly in continental Europe, the lack of available offshore resources skilled in the native language hinders the adoption of an offshore model, although we are now seeing the UK and Nordics embrace this model at a faster pace. In other areas of the world, the labor arbitrage does not yield adequate amounts of return on investment to warrant an offshoring strategy.

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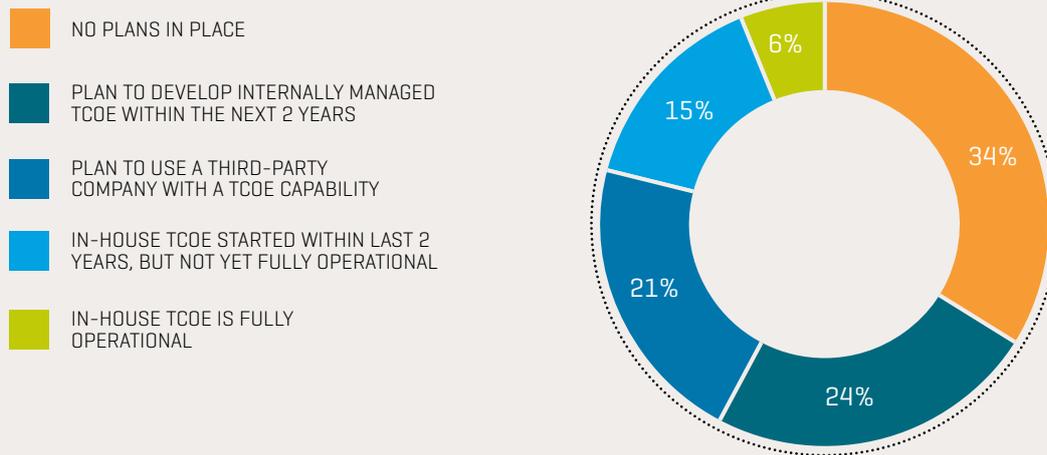
A MANUFACTURING  
BUSINESS, UNITED  
KINGDOM

“[A TCOE] IS SOMETHING I’M BUILDING HERE; IT REPRESENTS A SIGNIFICANT CHANGE IN OUR APPROACH BUT ONE THAT I PERSONALLY BELIEVE TO BE VITAL TO OUR BUSINESS SINCE I’VE COME FROM AN ORGANIZATION WITH AN OPERATING TESTING CENTER. WE KNOW THAT IT CAN REDUCE COSTS AND OVERALL TIME OF TESTING PRACTICES, AND GIVEN THE COMPETITIVE NATURE OF THE MARKET WE OPERATE IN, IT’S CRITICAL TO GET SPEED AND COSTS DOWN WHILST GETTING QUALITY UP. WE BELIEVE A TCOE CAN DO THIS.”



PLANS FOR A TESTING CENTER OF EXCELLENCE

FIGURE 4



Base: 924 Respondents

**AN APPETITE FOR CHANGE**

However, we are witnessing a growing interest in centralizing QA operations. Survey respondents indicated a significant trend towards new investment in TCOEs, guided by the imperatives to reduce time-to-market and costs, increase quality, and gain better control of the whole lifecycle process.

Whilst only 6% of organizations currently have a fully fledged operational center, this presents a 50% increase from 2011 (4%) – a small but significant step. On a positive note, almost two-thirds (60%) of firms are currently in the process of building or planning a TCOE, while a third of these companies (21%) plan to leverage an outsourced partner.

The percentage of organizations reporting that they have no plans to set up a TCOE has fallen significantly from last year (45% to 34%), and we predict that this will fall further over the coming few years as the TCOE model gains recognition for delivering performance improvement. This trend begs the question – what is driving the surge in interest in industrializing testing activity?

**LESS COST, MORE SPEED**

Firms are centralizing their QA infrastructure in order to reduce time-to-market, bring down the cost of testing, and manage testing resources more effectively. Compressing time-to-market is the primary reason for TCOE implementation, cited by 36% of respondents, and especially those in what might be called the more

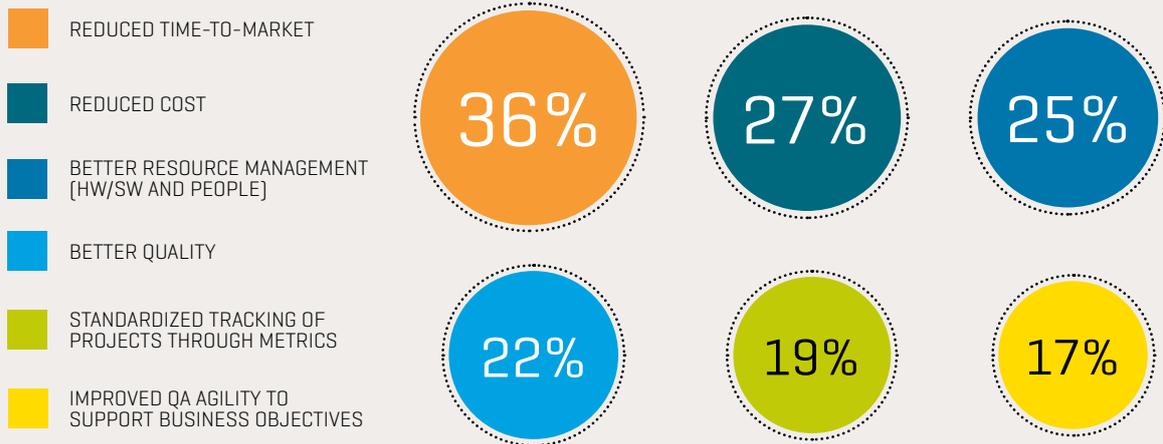
mature economies. Add to this the 17% aiming to enhance the agility of their QA operations, and it is clear that speed is a key driver of growing TCOE adoption.

In an unpredictable global economy, and with market and business expectations focused on producing better products faster, time-to-market has become essential in gaining or maintaining competitive edge and maximizing profits. As a result, development cycles are being squeezed, and testing teams have to do more with less. A TCOE offers the opportunity to meet these challenges head on.

Reducing the cost of testing activity is next on the priority list, identified by just over a quarter (27%) of organizations,

**EXPECTED BENEFITS FROM IMPLEMENTING A TESTING CENTER OF EXCELLENCE**

FIGURE 5



Base: 1221 Respondents

closely followed by the need to manage hardware, software, and human resources more efficiently and productively (25%).

It is interesting to observe that cost – at least for economies such as North America – is not the overriding priority. Most organizations have been focused on cost cutting for many years, and costs have been pared down to a minimum, with strategies such as outsourcing delivering benefits. It should not be a surprise, therefore, that companies in these regions are now seeking advantages beyond the purely financial.

These objectives for moving to a TCOE model prompt us to ask: why has efficiency in meeting time-to-market deadlines risen to the top of firms' agendas? What is different in today's market environment that has rendered the decentralized approach less desirable for the QA function in some instances?

**“FOR US, THE MOVE TOWARDS A TCOE IS PART OF THE WIDER UNION BETWEEN THE BUSINESS AND IT SIDE OF THE ORGANIZATION. WE NOW HAVE A MUCH STRONGER LINK BETWEEN THE TWO, AND WHILE THAT MEANS WE FEEL MORE ABLE TO UNDERSTAND AND ANSWER DEMANDS, IT DOES INCREASE PRESSURE ON TESTING TO BE MORE EFFICIENT AS A WHOLE – DECENTRALIZED TESTING TEAMS JUST COULDN'T PROVIDE THAT EFFICIENCY AND IT MEANT THAT WALLS EXISTED BETWEEN THE TEAMS, WHEREAS SHARED EXPERIENCE AND BEST PRACTICE ARE FAR EASIER WITHIN A TCOE FRAMEWORK.”**

A FINANCIAL SERVICES BUSINESS, FINLAND



Based on the survey responses, together with the experiences of our clients, we believe there are three key factors at play: the market environment, rising technology expectations, and diversity of delivery models.

### 1. The market environment

Continuing market unpredictability means that organizations can ill afford to take the emphasis away from cost reduction. Many remain firmly in cost-saving mode where QA is concerned: some still aim to shave as much as 30-40% off their current testing budgets.

This report also notes that QA budgets are increasing but that more is being demanded of teams and more complex developments are requested. So while budgets are increasing, there is still a need to control costs.

In parallel, there is considerable pressure to develop applications and bring them to market as rapidly as possible. At the same time, firms also need to focus on innovation to prepare for an eventual upturn in the global economy.

### 2. Rising technology expectations

Intensifying this pressure on application development is an increasingly competitive landscape, fuelled by growing customer demands. Customers – both internal and external – expect to access services and purchase products whenever they want, on whatever device they choose. To meet this demand for 24/7 availability, there is mounting pressure to deliver applications as quickly, efficiently, and cheaply as possible – and this is particularly evident in the mobile space where expectations are well advanced and are most likely going to increase over time.

### 3. Diversity of delivery models

In response, QA departments are capitalizing on the efficiency gains offered by cloud technology, increasingly outsourcing testing to cloud environments, and buying resources on demand, to reduce cost and time to bring applications to market.

A further step to speed up the development process is the wider adoption of Agile methodology. This is currently being used by over a third of testers (37%),

analysts (34%), and developers (29%). And encouragingly, three-quarters (75%) of Agile testing is already being performed offshore, a situation that seemed unlikely a few years ago.

## OFFSHORE ADOPTION: A KEY DETERMINANT FOR TCOE IMPLEMENTATION

Centralizing and professionalizing the QA function undoubtedly presents a valuable opportunity to save costs in a tough economic climate. However, motives driving consolidation are, in part, a function of how far different regions have already leveraged the cost benefits of offshoring.

As a rule, markets with greater levels of offshoring – primarily North America and the UK – are less focused on cost reduction. Offshoring has been considered, executed, and reviewed, and there is little remaining scope to further squeeze labor arbitrage. Therefore, other models are being exploited, such as TCOE, for achieving better quality, being quicker to market, and more effectively using resources. Cost is not an easy win for the more mature markets – they have to look at other key benefits to drive more efficient and focused QA.

Conversely, other regions with lower levels of offshoring remain more keenly focused on cost reduction. This is understandable, given that many are in the early stages of offshoring and thus have more resource costs to reduce. This difference is reflected in our survey results.

North America and the UK are the only two regions where the majority of testers are located either offshore or nearshore (55% and 50% respectively). And they are the two least cost-focused markets: only 15% and 16% of companies cite cost reduction as a reason for establishing a TCOE.

In South America, by contrast, offshoring has been far less exploited, and (it should be noted) in Brazil is actively discouraged by government policy. Only 38% of testers in the region are offshored, compared to 48% on average. Here, cost reduction is a far greater priority for TCOE operations than elsewhere: more than half of respondents (54%) identify cost reduction as the primary driver (compared to just 27% on average).

So as markets mature, cost becomes less of a driver, and the focus moves towards reducing time-to-market.

## SECTORS

Public organizations seem to be leading the way in TCOE adoption, because, along with Telecoms, Media, and Entertainment (TME), they can claim the lowest proportion of organizations with no plans to implement a TCOE (30%). They have also experienced the steepest drop in this proportion – down markedly from 59% last year.

This is likely being driven by the cost reduction imperative that is behind many organizations' TCOE plans. With spending austerity being implemented by many governments, public bodies are being asked to do more with less, while maintaining service levels and quality. As an efficiency driver, an onshore TCOE is a compelling model, particularly as offshoring is a political anathema to many countries.

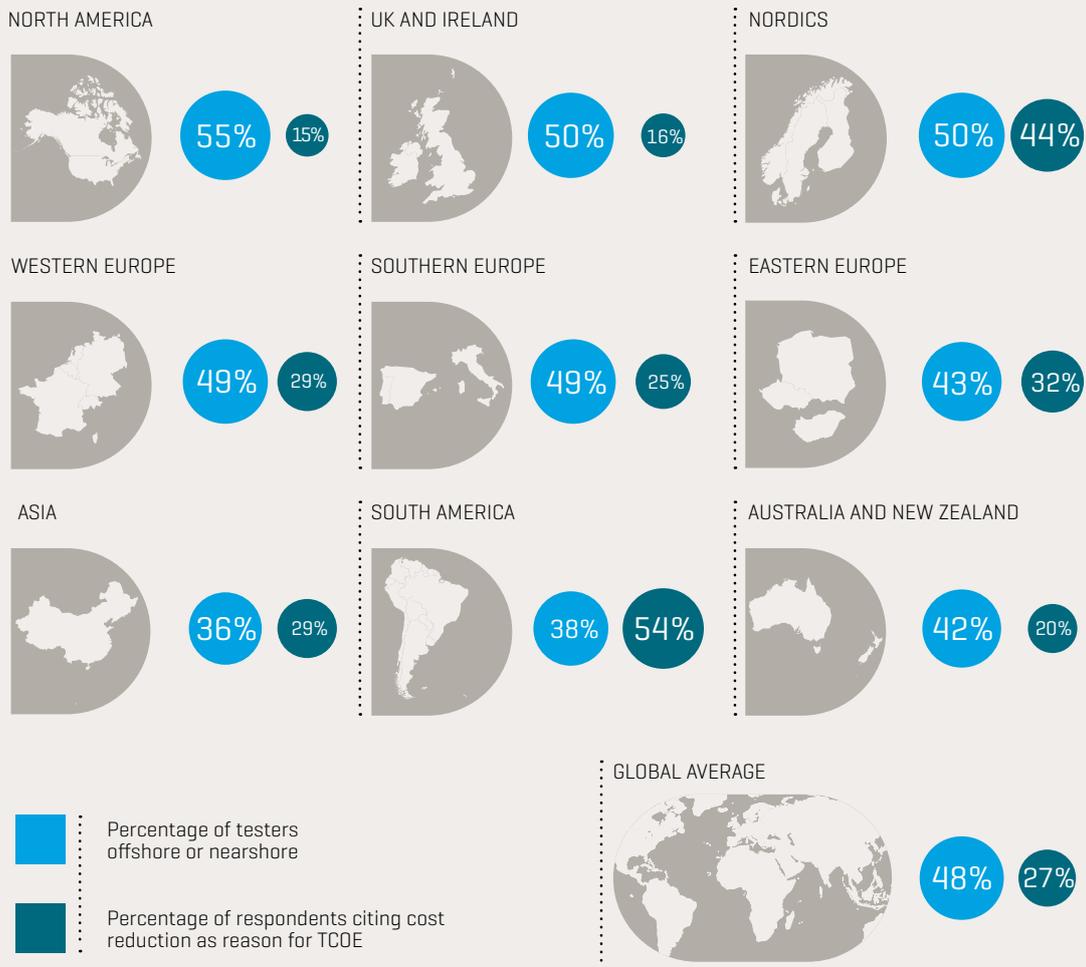
For other sectors, the imperative is responding faster to consumer expectations, changing market demands, and time-to-market. Two-thirds (66%) of CPRD respondents now operate a testing center, or plan to – significantly up from 41% last year. Streamlining of supply chains and application testing would appear to be complementary. And this upturn is also true of the FS industry, where adoption is up from 58% to 69% .

Finally the High Tech sector, which includes aerospace and defense companies, appears to be closing down internal centers in favor of an outsourced model, as time-to-market is a major issue in this sector. The sector had a remarkably high proportion of in-house facilities up and running last year (17% compared to an overall average of just 4%), while only 8% planned to work with a third party. This year, the tables have turned. Just 6% now have their own TCOE, while 17% plan to use an outsourced partner.

This year's data indicates that TCOEs are gaining traction, with growing levels of adoption across the board. As a flexible model, it offers significant advantages and opportunities to fully leverage existing resources.

PERCENTAGE OF OFFSHORING COMPARED TO COST  
 REDUCTION AS A REASON FOR TCOE

FIGURE 6



Base: 1553 Respondents

Organizations are turning to TCOEs to consolidate their QA operations in response to market pressures, technology demands, and emerging models of testing delivery



# MOBILE TESTING: BEHIND THE CURVE

Mobile has certainly changed the game for enterprise IT. Organizations around the world now need to deliver continuous access, anytime and anywhere, to thousands of employees and millions of customers, over a bewildering array of devices.

Due to cost pressures, firms are no longer willing to pay for, and thus control, their employees' mobile-access devices, leading to a bring-your-own-device culture. The situation is further exacerbated because organizations are unwilling or unable to support the proliferation of personal devices such as smartphones and tablets being used at work by employees. However, as the prevalence of non-company approved devices becomes mainstream and employees demand access to the flexibility and productivity that mobile offers, IT departments are now being forced to embrace this as the new reality and address the unique challenges of this paradigm shift.

Mobile has also turned IT security inside out. A firm's entire infrastructure can no longer be tucked safely behind a virtual private network and firewall. What's more, employees are prepared to download and try out apps on mobile devices with a latitude they would not consider acceptable on a desktop or laptop.

In addition, the need for mobility has reset expectations of what constitutes application quality. With traditional software, users expect flawless functionality first and foremost, but mobile users are seeking convenience. They expect robust performance and usability on the move, and are more inclined to tolerate the occasional glitch along the way, as long as the application performs well and is user-friendly. QA teams may need to rethink their testing strategies and priorities

as the mobile era adds a further level of complexity to users' needs, demands, and expectations.

## UNDERPREPARED AND ILL EQUIPPED

Our research suggests that organizations may not be giving mobile the priority it deserves. Only 31% of respondents currently test mobile applications, and those surveyed readily admit to being ill equipped for mobile testing. This suggests that QA has fallen behind the mobile curve.

A troubling two-thirds of organizations (65%) do not have the right tools to test mobile applications, and equally concerning is the 52% who do not have access to the required devices. It would appear that organizations either do not have a good grasp of the infrastructure challenges posed by the mobile era or are unable to address these new demands. Meanwhile, a third of organizations lack the testing methodologies and processes (34%) and specialist expertise (29%) necessary to effectively certify mobile applications.

## PERFORMANCE IS THE KEY TO SUCCESS

Organizations that are conducting mobile testing seem to be working towards a different set of quality standards as compared to traditional testing. The primary focus is on the application's performance rather than its functionality. Efficiency of performance was identified as a focus for mobile testing activity by almost two-thirds (64%) of firms.

The usual priorities – such as functionality and security – are being pushed lower down the scale as companies place more emphasis on the demands of end-users on mobile platforms, which are different from the demands of a traditional

desktop application. Performance is far ahead of functionality (cited by 48%) on firms' priority list for mobile testing. Security, a perennial concern where mobile is concerned, is a priority for less than a fifth (18%) of organizations. This does not mean that companies are no longer concerned with security, but rather that the perspective on security has changed with the bring-your-own-device culture and method of disseminating apps. Unlike with traditional desktops, companies cannot control what apps are installed on personal devices, so the concept of security is shifting from a denial of access to the protection of sensitive data and ability to wipe clean certain apps or data.

Even lower on the radar is the certification of applications, cited by just 14%, despite high levels of inconsistency in the quality of mobile apps on different operating systems.

## SPECIALIST PARTNERS ARE PLUGGING THE GAP

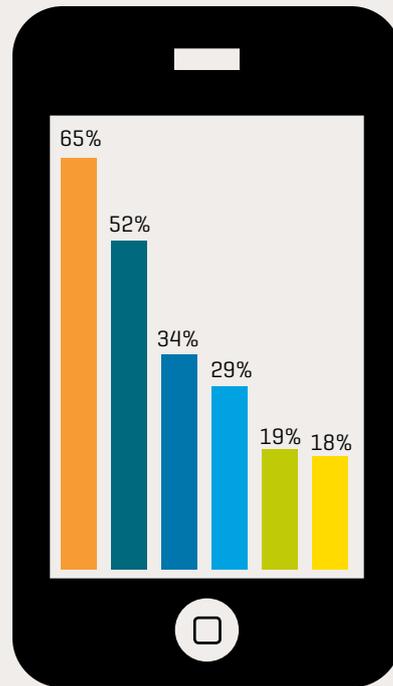
The number one criterion when selecting external partners to assist with mobile testing is the capacity to test across several networks, identified by almost two-thirds (62%) of organizations. This reflects the need to ensure coverage, as businesses seek partners who can deliver testing in a variety of environments.

Interestingly, cost reduction is less of a consideration (cited by only 25%), despite being high on the list of factors driving both cloud and TCOE adoption. This may be due to a number of factors: mobile applications are relatively cheap to produce, the focus is on managing risk rather than cost, and firms' need to address their lack of readiness and expertise where mobile QA is concerned.

**CHALLENGES TO MOBILE TESTING**

FIGURE 7

- DO NOT HAVE THE RIGHT TOOLS TO TEST
- DO NOT HAVE THE DEVICES READILY AVAILABLE
- DO NOT HAVE THE RIGHT TESTING PROCESS/METHOD
- NO MOBILE TESTING EXPERTS AVAILABLE
- DO NOT HAVE IN-HOUSE TESTING ENVIRONMENT
- NOT ENOUGH TIME TO TEST

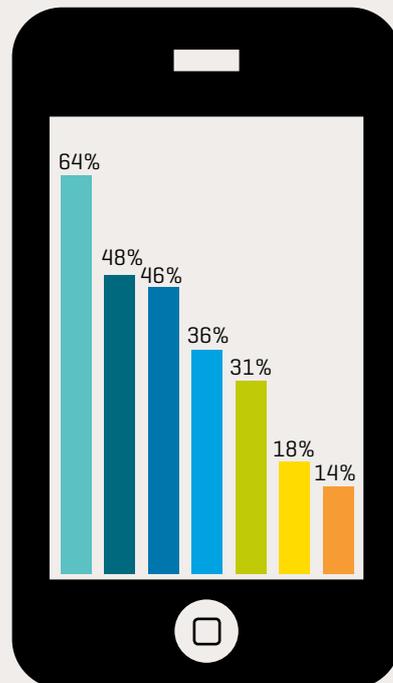


Base: 485 Respondents

**PRIORITIES WHEN TESTING MOBILE APPLICATIONS**

FIGURE 8

- EFFICIENCY/PERFORMANCE (INCLUDING NETWORK-RELATED)
- FUNCTIONALITY
- PORTABILITY
- USER INTERFACE/EASE OF USE
- COMPATIBILITY/REGRESSION TESTING
- SECURITY (PROTECTION OF SENSITIVE DATA OVER THE PHONE OR AIR)
- CERTIFICATION OF APPLICATION



Base: 485 Respondents



**REGIONAL VARIATIONS**

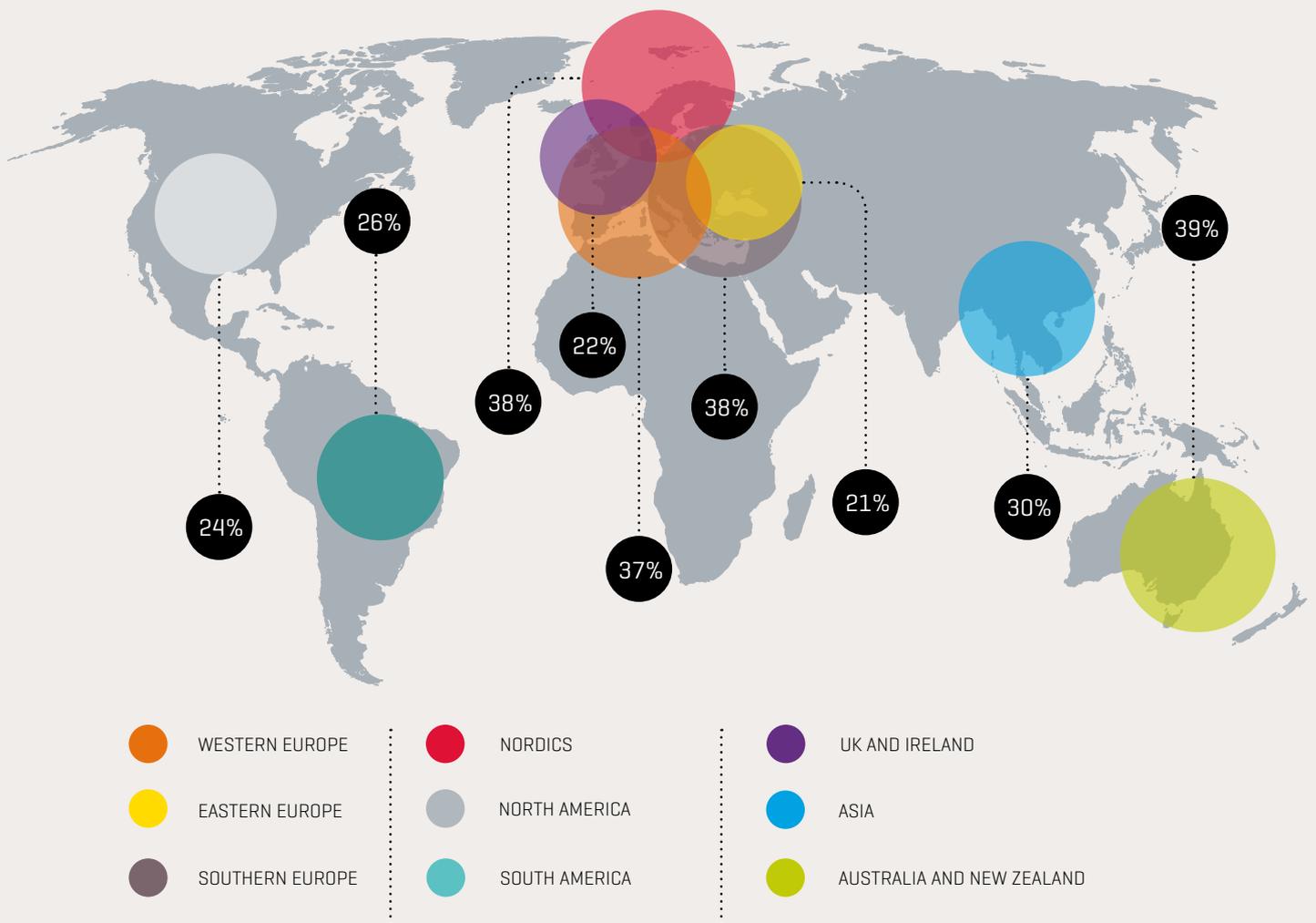
We might expect the strongest emphasis on QA in the mobile arena to be seen in Asia in particular, as smartphone and tablet penetration are accelerating at a blistering pace in China. But the distinction between East and West economies is not clear-cut. Indeed, in Asia, the proportion of organizations conducting mobile testing sits at 30%, close to the all-sample average of 31%.

Regions with traditionally high levels of mobile adoption, with the exception of Asia, have – unsurprisingly – the highest levels of mobile testing. Over one-third of firms in Australia and New Zealand, the Nordics, and Southern and Western Europe currently test mobile applications.

Regions displaying lower levels of mobile testing include Eastern Europe and the UK and Ireland, where only a fifth of businesses carry out mobile testing, and just a quarter do so in North and South America.

**PERCENTAGE OF RESPONDENTS TESTING MOBILE APPLICATIONS, BY REGION**

FIGURE 9



Base: 1553 Respondents

### ASIAN CHALLENGES

The explosion of the mobile market in Asia is reflected in the QA challenges and priorities faced by organizations in the area. A greater percentage of Asian firms confirm they faced the common mobile challenges as compared to all the companies on average.

Asian firms also place much more emphasis on portability and compatibility across devices when conducting mobile testing. Portability is identified as a priority by 58% of businesses in this region, compared to less than half (46%) on average. Compatibility is cited by almost as many (55%), compared to less than a third (31%) overall.

This focus might be driven by the far wider selection of devices available to users in the region. In China, for example, mobile customers can choose from just about any handset available worldwide. In the US and Europe, networks offer only the handsets for which they have contractual arrangements with manufacturers. As a result, the choice available to customers is far more limited.

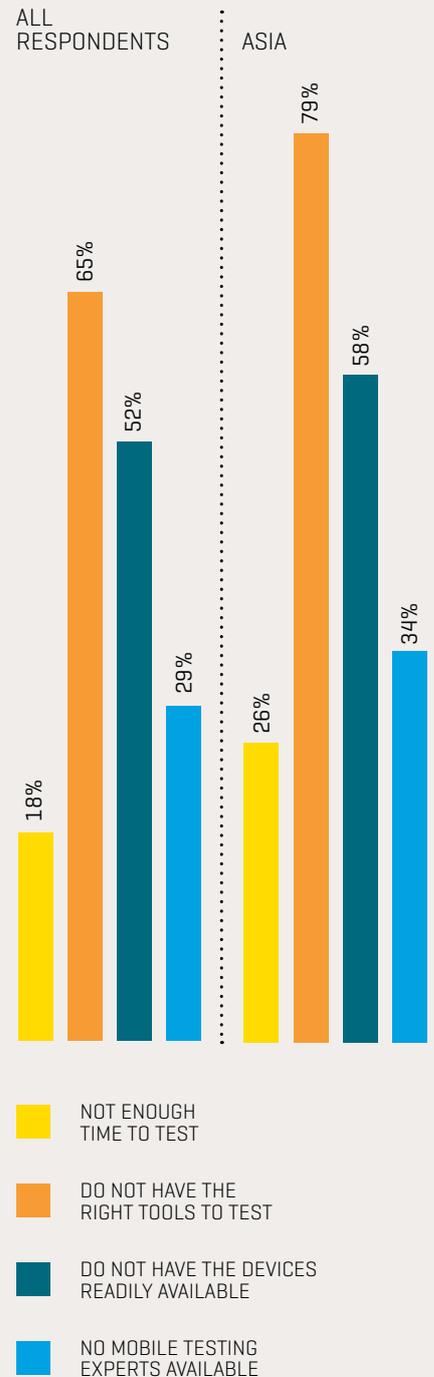
### PERFORMANCE VERSUS FUNCTIONALITY

Elsewhere, the emphasis on application performance is particularly acute in the UK and Ireland (75%), against an average of 64%. This could be due to its being a more mature market where end-users demand more from their mobile apps. Consider the landscape a decade ago, when having a browser on a mobile device was touted as a new feature, whereas today these same users want apps that are tailored for specific needs. The opposite is the case in South America and Eastern Europe, where only around half of organizations focus on performance.

Instead, South American firms are focused primarily on functionality, and more than four-fifths identify this as a priority, compared to just under half overall. Mobile security is also a heightened concern in the region, cited by 30% against an 18% average. Eastern European businesses are even more worried about security (36%), and are equally concerned with application certification (compared to just 14% on average).

### GREATEST CHALLENGE WHEN TESTING MOBILE APPLICATIONS AND DEVICES

FIGURE 10



Base: 485 Respondents



## SECTOR PERSPECTIVES

A look at mobile testing by industry throws up some surprising results. Firstly, it is Manufacturing firms, rather than those from more consumer-facing industries, that are most likely to conduct mobile testing (37% compared to 31% on average).

We might expect the TME sector to be most at ease with mobile technology. However, their QA demands are uniquely complex, comprising the need to test networks, equipment, and billing systems, among others that are applicable only to TME firms. As a result, just 30% of firms in the technology-intensive TME space currently test mobile applications, equal to the all-sample mean. Some 62% lack the necessary tools to test mobile applications. This is only slightly better than average (65%), and almost one-third (32%) lack in-house expertise, compared to just 29% overall. Perhaps this is due to the TME providers focusing their QA efforts on the mobile infrastructure and leaving the testing of mobile devices to the handset manufacturers.

Public Sector organizations (27%) are the slowest to adopt mobile testing. This may not be quite so surprising in a sector not traditionally viewed as a leader in technological innovation. But it does present a major issue in an era when citizens increasingly expect to interact while on the move with public service providers, just as they do with commercial brands.

Public bodies are also the least focused on performance, although this is still their greatest area of priority, cited by more than half of organizations (53% compared to 64% average). The sector places a higher emphasis than average on security and user experience, in line with their public responsibilities.

Despite its reputation for innovation, the FS industry faces some of the most acute mobile testing challenges. Almost three-quarters (72%) of FS firms lack the right tools, compared to 65% on average, and 38% lack mobile testing expertise, against 29% overall. Financial firms are the most acutely concerned about application performance with 72% citing this as a priority.

User-friendliness is an understandable priority for the CPRD space. Ease of use and the user interface are a focus for 50% of CPRD firms (compared to 36% on average).

Mobile is certainly having a significant impact on the QA function and it seems that QA has been slow to react to the expectations from within the business. We would expect swift reassessment of testing priorities and increased investment over the coming year to handle the rush of mobile applications either in-house or with specialist providers.

**“IT’S AN AREA OF OUR BUSINESS THAT TYPIFIES HOW THINGS ARE CHANGING, IN MY OPINION. THE GUYS IN MARKETING SAY ‘WE NEED A MOBILE APP’; SALES OR PRODUCT EXECs AGREE AND THEN SEND IT ACROSS TO DEVELOPMENT AND TESTING TO PUSH IT THROUGH IN HALF THE TIME WE MIGHT ACTUALLY NEED. IT’S NOT GOING AWAY EITHER. MORE AND MORE OF OUR BUSINESS IS DONE ONLINE [IN GENERAL] SO IT’S SOMETHING WE NEED TO GET HOLD OF AND UNDERSTAND QUICKLY.”**

A RETAIL BUSINESS, UNITED KINGDOM

PERCENTAGE OF RESPONDENTS WHO TEST MOBILE APPLICATIONS OR DEVICES, BY SECTOR

FIGURE 11



Base: 1553 Respondents

GREATEST CHALLENGE WHEN TESTING MOBILE APPLICATIONS OR DEVICES, BY SECTOR

FIGURE 12



Base: 485 Respondents



# CLOUD: GATHERING PACE

28%

of testing currently occurs in a cloud environment, and is set to rise to 39% by 2015

Cloud computing continues to generate a significant amount of attention as almost every market forecast indicates exponential growth in this area. Within this climate, cloud adoption in QA is also gathering momentum, because the business case is resoundingly clear. As more applications are being hosted in the cloud, the necessity for testing in cloud environments is growing apace. And organizations are seizing the benefits that the cloud offers by buying services on demand and getting access to physical resources more quickly and cheaply to cut QA spend.

## CLOUD COVERAGE ON THE RISE

The extent to which businesses and their QA function are now embracing the cloud marks a step up from the evolutionary

progress revealed in last year's report. Our research shows that almost a quarter (22%) of software applications are now hosted in the cloud. This is expected to rise even further to a third (32%) by 2015, an indication of the acceptance of cloud as part of the mainstream of IT infrastructure.

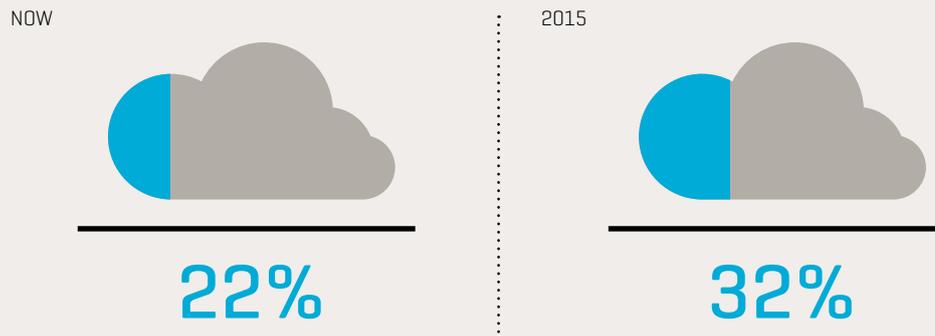
Testing in the cloud is also expanding at a correspondingly healthy rate. Some 28% of testing now occurs in a cloud environment, a proportion forecast to rise to 39% by 2015. Only two years ago, some 31% of companies declared they would not test via the cloud over the next three years, and this has now dwindled to just 4%, a clear indication that testing in the cloud is becoming the new norm.

**“THE CLOUD IS SOMETHING THAT HAS BECOME A SIGNIFICANT PRIORITY FOR OUR ORGANIZATIONAL DIRECTION IN THE INFORMATION TECHNOLOGY DEPARTMENT. WITH REGARDS TO TESTING, IT’S OPENING UP A WAY OF TURNING ON AND OFF A STREAM OF NEW SKILLS AND ABILITIES IN A WAY THAT IS BOTH FAST AND COST-EFFECTIVE WHEN WE NEED THEM. WE CAN REACH OUT AND GET EXACTLY WHAT WE NEED WITHOUT DELAY.”**

A FINANCIAL SERVICES BUSINESS, THE NETHERLANDS

**PERCENTAGE OF APPLICATIONS HOSTED IN THE CLOUD,  
NOW AND 2015**

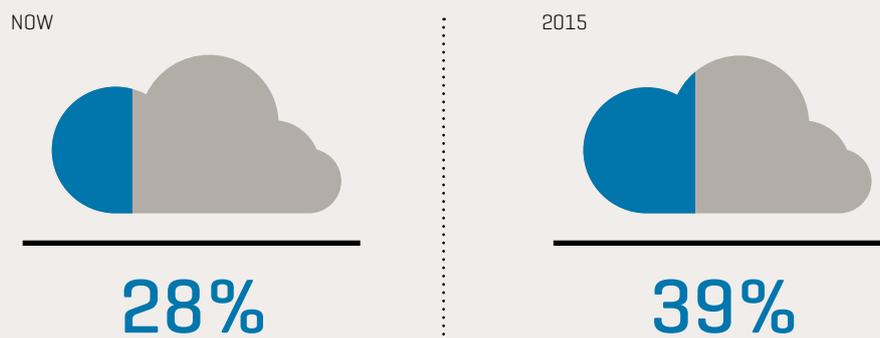
FIGURE 13



Base: 1,553 respondents

**PERCENTAGE OF TESTING CONDUCTED IN THE CLOUD,  
NOW AND 2015**

FIGURE 14



Base: 1,553 respondents



“WE EXPERIENCE PEAKS AND TROUGHS IN OUR TESTING PROGRAM, SO TAAS PROVIDES A CERTAIN DEGREE OF FLEXIBILITY. WHILE SOME APPLICATIONS MAY BE RUN OF THE MILL, SOME MAY HAVE MORE AD HOC REQUIREMENTS THAT PUSH US TO MEET UNIQUE OR TEMPORARY NEEDS. TAAS ALLOWS US TO DO THIS WITHOUT THE BURDEN OF GREAT COST OR ADDING TO PROJECT TIME.”

A RETAIL BUSINESS, DENMARK

### RISING DEMAND FOR ON-DEMAND SERVICES

As QA professionals become more comfortable with the cloud as a testing platform, organizations are increasingly capitalizing on the on-demand benefits it provides.

Companies that are accustomed to using cloud-based infrastructures are now demanding similarly flexible offerings for their software licenses in the form of Software as a Service (SaaS), where costs incurred are matched against actual usage.

## Organizations are increasingly capitalizing on the on-demand benefits of the cloud

Almost a third (31%) of firms' testing software is currently provided on a SaaS basis – compared to only a quarter (25%) last year. This is expected to reach close to half (43%) by 2015. Furthermore, some 30% of firms had no SaaS arrangements in place for testing software in 2011; this has fallen to just 8% this year.

### THROWING CAUTION TO THE CLOUD?

Conventional wisdom dictates that lingering doubts over the cloud and, in particular, its perceived lack of security would discourage organizations from migrating their most business-critical IT infrastructure to the cloud. Contrary to this assumption, our survey reveals a growing tendency to test critical applications in cloud environments.

In fact, organizations are actually testing more critical applications (61% – both internal and external – than non-critical software (39%) in the cloud. However, it is worth noting that internal software accounts for two-thirds of these critical applications, and external software just a third.

### TESTING AS A SERVICE

Although starting from a low base, firms are also increasingly treating the testing activity as an on-demand utility, giving rise to the term Testing as a Service (TaaS) – the delivery of application testing services on a pay-per-use model, using cloud-based test environments and software tools. While only 11% of businesses currently use TaaS arrangements, almost four-fifths (78%) plan to introduce the concept, and almost half (47%) will do so within the next 12 months. By 2015, only 11% will have no TaaS arrangements, a pointer to how ubiquitous this delivery model will have become.

### AN OPPORTUNITY TO REDUCE COST

When asked about the benefits of TaaS, respondents were emphatic in their enthusiasm. The most highly-anticipated benefits from TaaS arrangements were reduced cost, identified by 58% of businesses, and more effective management of testing resources (cited by 49%). By contrast, reduced time-to-market (the main driver for TCOE consolidation) only ranks third (42%), and improved quality is even less of a focus, mentioned by just 24%.

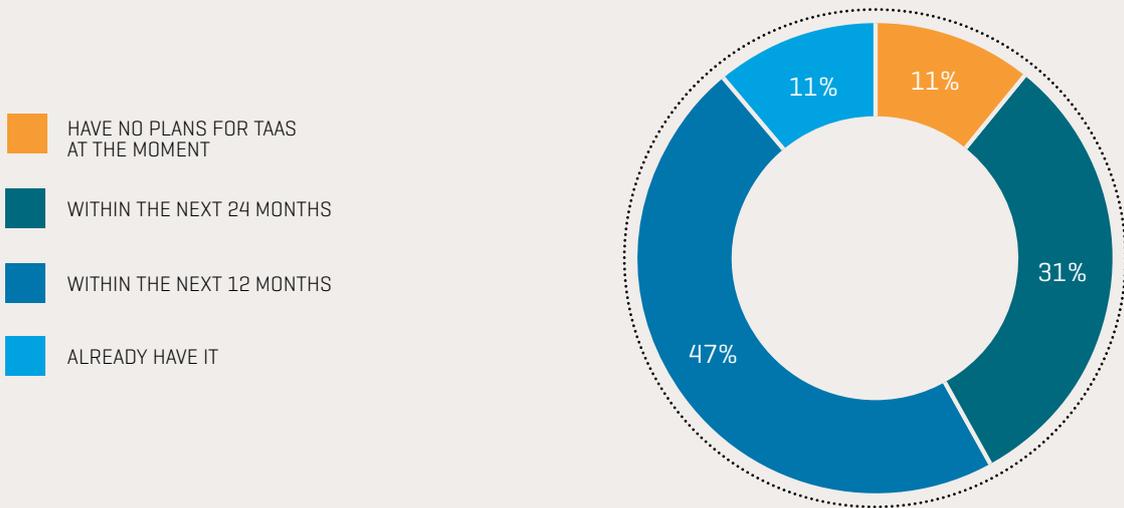
The cost driver is clearly important when assessing TaaS services, as the focus is on how to reduce, for example, licensing costs, to pay only for what is used, as opposed to improvement in quality that can be achieved through other means.

So why would organizations view cloud-based TaaS as a greater cost-saving opportunity than consolidation, as provided by TCOEs? TaaS offers the chance to bring down costs that have already been heavily optimized and the greater portion of testing spend goes towards resource costs. In mature markets, this element has already been drastically reduced by successive waves of offshoring and restructuring. And in developing markets, low labor costs are a given.

So, adopting a cloud utility service model presents a rare opportunity to further squeeze costs by paying only for what is needed when it is needed, as opposed to high investment in often dormant technology. TaaS also provides increased flexibility in servicing and pricing and the ability to quickly scale up or down as required for ad hoc or ongoing projects.

PLANS FOR MOVING TO TAAS MODEL

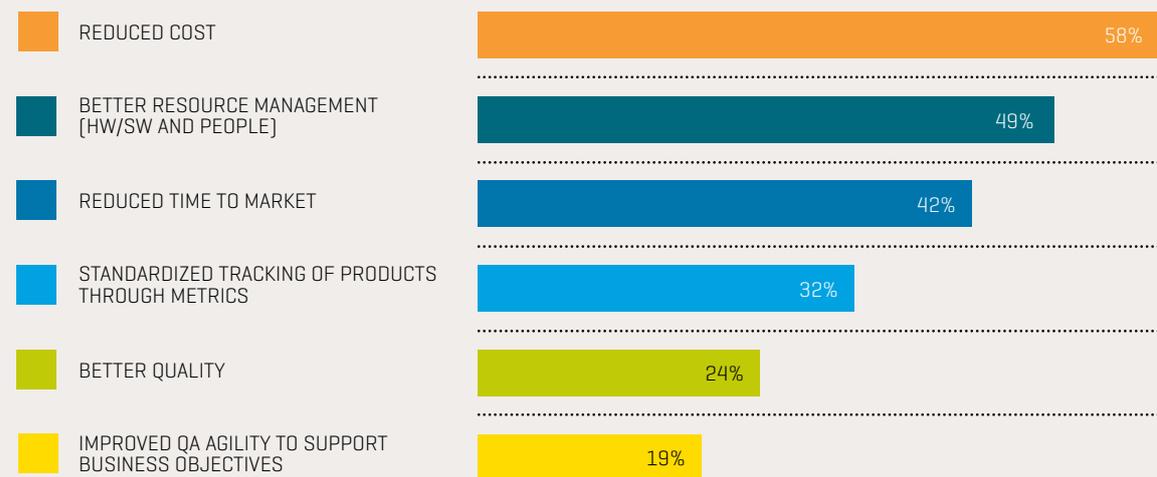
FIGURE 15



Base: 1553 Respondents

EXPECTED BENEFITS FROM TAAS

FIGURE 16



Base: 1553 Respondents



## LOW HURDLES TO ENTRY

Encouragingly, as adoption has increased, the cloud in general is now seen as a far greater opportunity than a risk. The potential challenges associated with cloud-based operations provoked far less response among respondents than the benefits, so the gains clearly outweigh the pitfalls.

# The benefits of cloud-based QA activity clearly outweigh the pitfalls

This can be seen most sharply in the halving of levels of concern over last year's biggest worry – security. Predictably, back in 2011, more than half (55%) of organizations saw security as the most acute risk associated with using a cloud environment. This year, taking TaaS as an example of a general increased ease with using cloud-based delivery, security came only third on the list of the challenges anticipated when adopting TaaS. Even the starkest current challenge – loss of control over total testing spend – is troubling the minds of less than a third (32%) of companies.

Yet, despite the overall enthusiasm, these concerns about loss of control over spend signal a continuing concern and confusion about the cloud generally. In our experience, there is little reason to lose control of testing spend, as this can be prevented through robust governance, spend metrics, and service-level agreements.

Perhaps this anxiety is a legacy of poor outsourcing experiences, where contracts have exceeded cost estimates. Or it may reflect persistent economic instability: unable to reliably forecast market demand, businesses are struggling to calculate an accurate assessment of the scale of their testing requirements. Whatever the reason, we would encourage organizations to look to the benefits of this new model of testing service provision, as the concerns can be managed.

## MATURE MARKETS DRIVE ON-DEMAND PROVISION

Last year's report found emerging economies had the most aggressive plans to migrate QA activity to the cloud. In 2012, we see this leveling off, as cloud penetration in developing regions begins to catch up with that of mature markets.

As indicated earlier, as an example of cloud adoption, companies are increasingly looking to TaaS as a means of cost reduction and process efficiency. How is this reflected at a regional level? Plans show little variation between the global regions in the immediate term. For the most part, the more mature markets are driving on-demand uptake, with a high percentage of firms already adopting or planning to use TaaS services. Only 3% of North American firms have no plans to use TaaS, with a similar figure of just 5% in Western Europe. In Asia, only 7% do not anticipate TaaS in their future.

Yet this jumps to almost half (46%) in Eastern Europe and nearly a third (29%) in South America with no TaaS plans. However, looking ahead, South America is predicting a significant change, with respondents expecting almost half (46%) of testing to be cloud based by 2015, compared to the 39% global average.

For all regions, reduced cost is the primary benefit of TaaS, and taking into account better resource management, efficiency is the secondary driver for TaaS adoption. Emerging markets are particularly focused on cost reduction – seven in 10 Asian and South American businesses identify this as the primary benefit of TaaS, compared to 58% across the whole survey.

## SECTOR LEADERS AND LAGGARDS

Turning to the sectors, testing in the cloud is being led by the IT-intensive TME sector, where 31% of testing activity is currently cloud-based, followed by FS at 30%, compared to the 28% sector average. Both the TME and FS sectors are driven by technology and have traditionally been early adopters. Late adopters, with only a quarter of testing in the cloud, include E&U (25%) and Manufacturing industries

(24%). These two sectors tend to view IT as an enabler rather than a driver, and traditionally have spent less on IT.

The pattern is repeated when it comes to leveraging TaaS. Only 6% of TME respondents and 8% of FS companies have no plans to use TaaS, compared to 11% overall. Public Sector organizations are also embracing on-demand testing, with only 7% having no TaaS plans in place.

By contrast, some 30% of manufacturers are disregarding the on-demand testing provision altogether, as are 16% of E&U firms, and, as in last year's survey, CPRD businesses are slow adopters – currently 17% have no plans for TaaS.

## SMALL FIRMS RELUCTANT TO ADOPT

Organizations of all sizes are integrating cloud technology into their QA operations. Businesses are investing in the cloud to modernize and optimize IT infrastructures, while small businesses look to take advantage of its flexibility in order to circumvent the need for costly IT set-up. Large, medium, and small firms are all running approximately 28% of testing activity in cloud environments. Likewise, all three groups forecast this to rise to around 39% by 2015.

However, smaller firms are much more reluctant to conduct testing on demand. Almost a quarter (23%) have no plans to use TaaS, compared to just 6% of large and medium-sized organizations. Again, this may be driven by the fear that testing costs will spiral out of control or by a lack of awareness of the true benefits that TaaS can offer. More small businesses (35%) identify this as a challenge than their corporate (30%) or medium-sized (31%) counterparts.

Our research shows that the move towards a cloud-based infrastructure, supported by offerings such as TaaS, continues to grow across companies of all sizes. Organizations are primarily looking to achieve a more cost-effective and efficient means for QA through a flexible, agile, on-demand model. We expect that this trend will accelerate as the cloud matures and competitive pressures force non-adopters to reconsider their position.

“WE ARE MOVING MORE OF OUR TESTING INTO THE CLOUD, BUT IT’S ALWAYS GOING TO BE PROBLEMATIC FOR US. NATIONAL LEGISLATION RESTRICTS THE NATURE OF DATA THAT CAN BE STORED AND ACCESSED OUTSIDE THE COUNTRY; THEREFORE WE ARE CURRENTLY LIMITED AS TO WHAT EXACTLY CAN BE DONE VIA THE CLOUD.”

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A MANUFACTURING  
BUSINESS, GERMANY



# QUALITY ASSURANCE RESOURCES: A QUESTION OF VALUE

In an increasingly digitized era, the ability to monitor and assess the quality of software applications is critical to an organization's operations – not to mention its reputation. So confidence in the quality of QA resources to deliver on this priority is essential. Our data shows that this, unfortunately, is not always the case.

Our study finds that organizations consider their internal QA resources to be “average” overall, which we believe is of some concern given the increasing importance being placed on testing. On balance, companies believe that they can secure slightly better quality resources via external partners than by hiring internally.

One contributing factor could be that, historically, testing has not been viewed as a well-defined professional career across the world, although it is gratifying to see much evidence of this now changing. In developed countries, QA is becoming a recognized and dedicated profession, commanding increased salaries commensurate with the level of expertise and experience. In the less-developed markets, there is often a limited number of trained resources available, which is driving the need to use external expertise, often at a premium to internal cost structures.

## A FINE BALANCING ACT BETWEEN INTERNAL AND EXTERNAL

The majority of organizations (59%) characterize their internal QA teams as “average” in their QA knowledge and not necessarily up to speed with the latest testing tools and technologies. External resources fare better with slightly fewer companies (52%) describing external

testers in the same way. More significantly, only 4-5% of firms are confident that their resources (internal or external) are best in class.

However, when apportioning high praise, companies express more confidence in outsourced resources than their own employees. A third of firms (33%) score their external teams' knowledge and abilities a 4 or 5 (with 5 being the highest); less than a quarter (24%) score internal resource as highly.

This may reflect the fact that many external testers work for service providers whose business model is to offer large-scale professional teams of resources designed to elevate a company's existing capabilities. It may also reflect an increasing desire among certain economies to increase the level of QA skills they can offer to the global community.

Our study found minimal regional differences in confidence levels, which may reflect the fact that in the more mature markets, expectations are higher and the need to outsource greater, while in the emerging markets, expectations are lower and the available talent is starting to come through. Whichever the case, it is clear that there is room for improvement in the skill levels of QA resources, if they are to meet the exacting demands being placed on them.

## A QUESTION OF VALUE

Internal QA resources, while rated lower in terms of knowledge, are marginally more expensive, which is to be expected, as organizations seek external outsourced

skills predominantly to reduce costs. Firms are paying a global average hourly rate of US\$54.58 for internal resources, compared to US\$52.62 for external support.

Although this weighted average is not designed to be exact, the comparison is revealing, as it would indicate that organizations are getting more value from outsourced support, because they are paying less per hour for a resource that is more highly regarded, although the difference is small. This is potentially the case in economies where there is a greater number of available testers, and outsource providers compete on cost against in-house teams.

However, these figures need to be viewed in context. Hourly rates naturally vary greatly by geography, and price needs to be considered alongside the value that firms perceive they are getting for their investment.

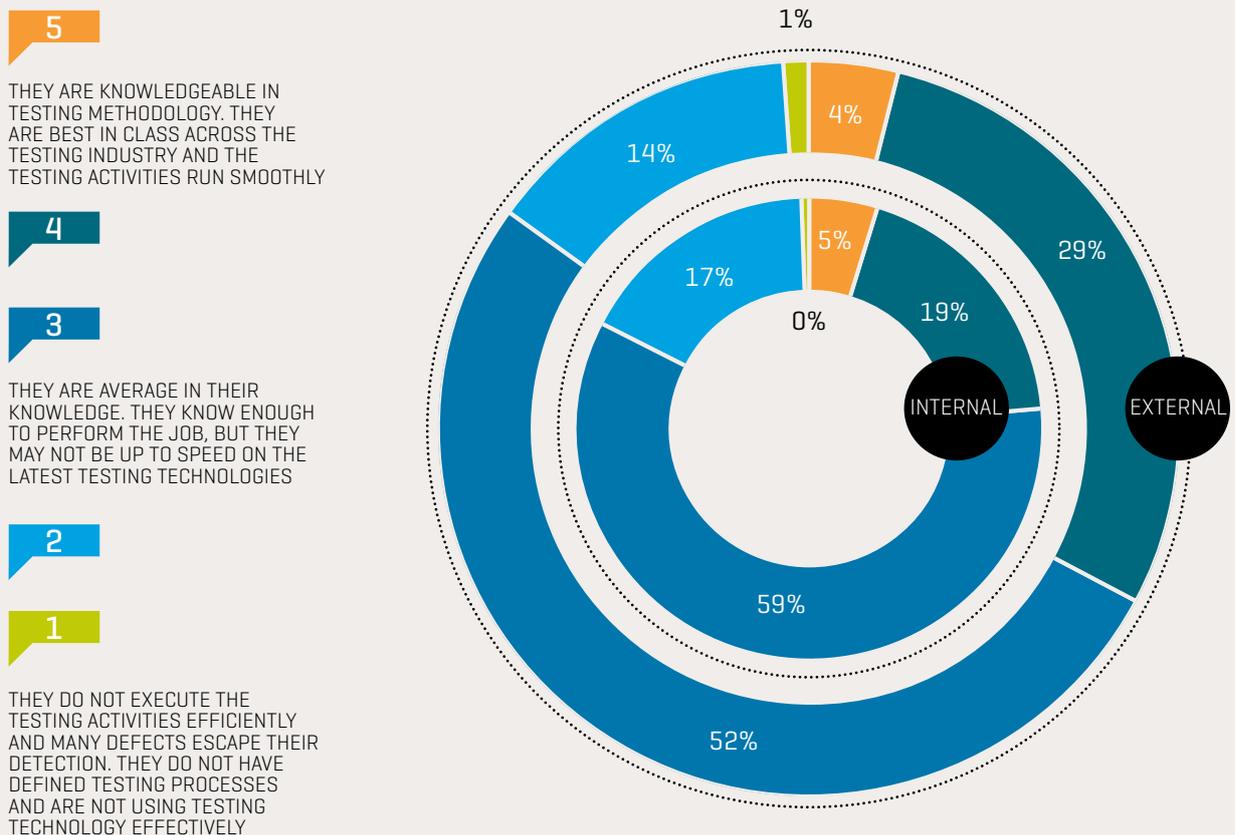
## REGIONAL PERCEPTIONS

Indeed, regional comparisons paint a contrasting picture, divided broadly along market maturity lines. While there is general agreement across the regions that external resources are more effective, there are wide disparities between how much each region is paying for both external and internal support.

In developed regions, there is a price premium on internal testing capacity. North American firms, for example, are paying around 20% per hour more for internal than external resources. We believe this reflects the increased standing of QA resources in North American organizations and the salaries they can command.

**RANKING OF EXTERNAL AND INTERNAL TESTING RESOURCES  
 [SCALE OF 1 TO 5, WHERE 5 IS HIGHEST]**

FIGURE 17



Base: 1553 Respondents

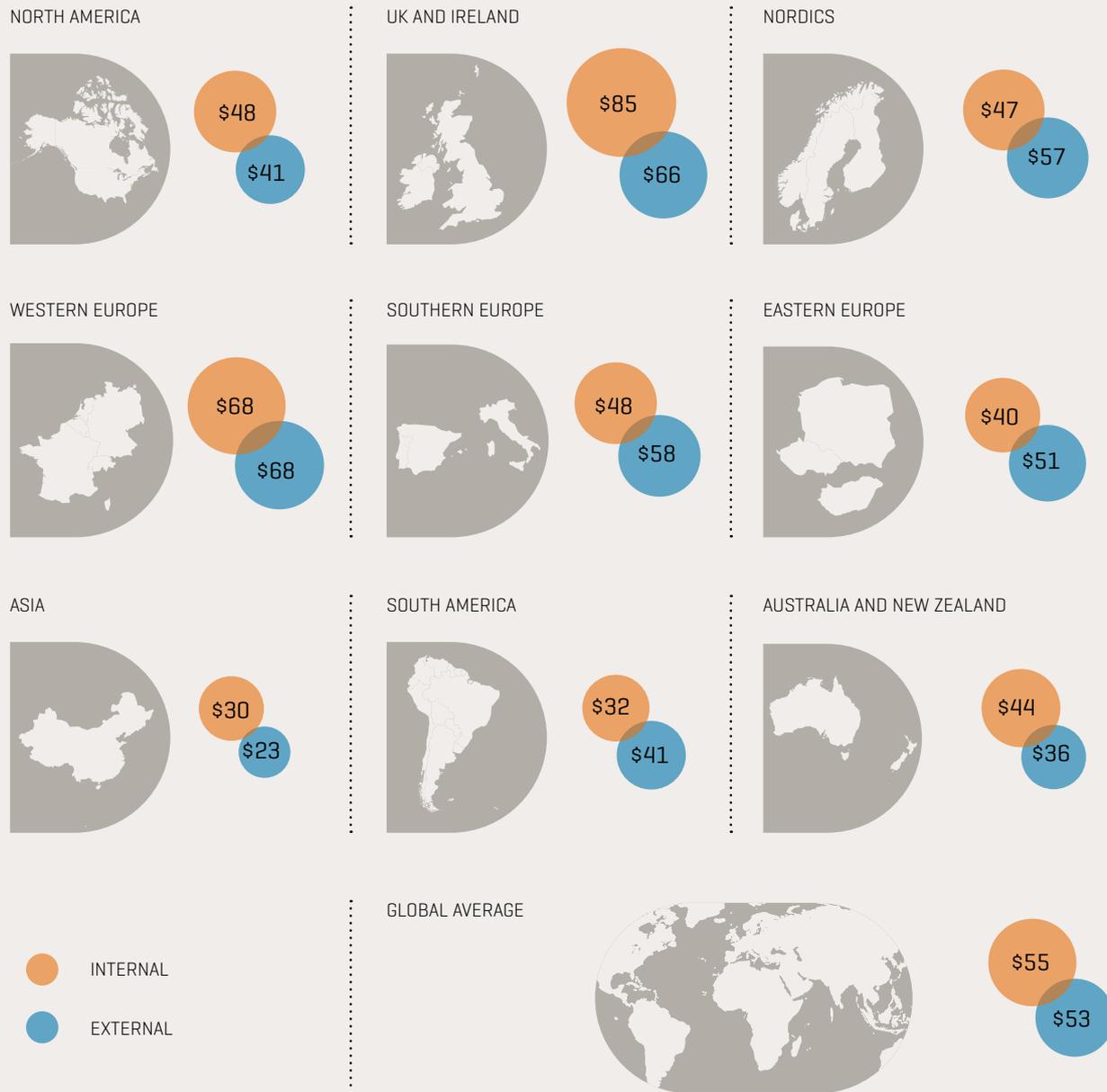
“OUTSOURCED TESTING WILL ALWAYS BE AN IMPORTANT OPTION, BUT HOW WE SOURCE THOSE TESTERS DOES TEND TO DEPEND ON PROJECT OR COST, RATHER THAN ANY SPECIFIC PREDEFINED RULES. WE USED TO USE INDIA-BASED SUPPLIERS A LOT MORE THAN WE DO TODAY, BUT THE COST BENEFITS WERE NOT BALANCED BY OUR INTERNAL CLIENT SATISFACTION FEEDBACK.”

A FINANCIAL SERVICES BUSINESS, AUSTRALIA



AVERAGE HOURLY RATE (US\$) FOR EXTERNAL AND INTERNAL TESTERS

FIGURE 18



Base: 1553 Respondents

As we have seen, North America is the most highly outsourced region, with businesses having transferred large proportions of their QA to lower-cost, offshore labor markets. As a result, they are paying well below the average for external support, and balancing this by paying a relative premium for high quality in-house experts.

Yet interestingly the quality rating does not differ by much between the two sets of resources. This may indicate a pragmatic approach from North American organizations in assessing both sets of resources on a relative value-for-money basis, balanced by availability constraints. This indicates a mature and measured approach in North America.

In emerging economies such as South America and Eastern Europe, however, the reverse is true. In these areas, QA is a less-developed, less-professionalized field; in some organizations, it may barely exist as a recognized function at all. As a result, dedicated external resources are more highly prized, and so come at a premium. South American companies pay around 30% more for external than internal teams; in Eastern Europe, the disparity is around 25%. The conclusion is clear – emerging markets may not immediately be saving costs by using external expertise, but judging by the recognition of the skills of external resources, companies are buying an enhanced quality of output.

## SECTOR PERCEPTIONS

One industry that does recognize the price premium and value of experienced QA resources is clearly FS. The industry is paying a hefty premium for internal support: \$62.18 per hour compared to the \$54.58 average. The FS sector is, of course, a unique, complex, and highly regulated domain, requiring very specific functionality expertise in addition to generic QA skills. Not surprisingly, this rare combination of skills pushes up the cost of QA capability for the industry.

Manufacturing companies are the most satisfied overall with the quality of their QA resource. Just over a third (34%) of manufacturers score their internal resource a 4 or 5, compared to the overall average of 23%. Almost two in five (38%) rate their external support highly (average 33%). It may be that the importance the sector places on ensuring the quality of its production output extends to its software applications, resulting in a greater appreciation of technical ability.

At the other end of the scale, only around a quarter of Public Sector organizations rate their internal (21%) or external (28%) QA resources highly. This might be a reflection of constrained local pay scales, or complexity of large-scale legacy systems, meaning that quality may be more difficult to achieve.

Two sectors – where a breakdown in quality could have dramatic consequences – rely on external expertise to compensate for a lack of confidence in their in-house resource. The Health and Life Sciences businesses and E&U have the lowest confidence in their internal teams: only a fifth of firms in these industries rate them highly, yet, by contrast, external resources in both are given a relative vote of confidence. Around twice as many organizations in these industries rate external providers highly.

## PAYING THE PRICE?

Experienced QA experts – both in-house and third party – possess a rare combination of highly technical abilities: business domain expertise, business process analysis skills and development, scripting, and testing capabilities, and up-to-date QA knowledge, to name a few.

In our experience, when it comes to paying the price for that expertise, organizations often have unrealistic expectations. Some may be unwilling to pay the higher cost for highly qualified, experienced professionals; others may be restrained from doing so by budgetary considerations.

Value for money is undoubtedly subjective. Getting the balance right between in-house and external teams, factoring in technical and business knowledge and relative costs, is challenging and requires constant monitoring and investment.

**“I’D LOVE TO BE ABLE TO PROFESSIONALIZE OUR TESTING FUNCTION – GIVE PEOPLE A CAREER AND THE PAY TO MATCH AND THEY’LL STICK WITH YOU. BUT THE REALITY IS QUITE THE OPPOSITE. TESTING IS SEEN AS A ‘NECESSARY EVIL’ IN MANY ORGANIZATIONS. THIS MEANS ORGANIZATIONS NEVER GIVE [TESTERS] THE PROPER ATTENTION [THEY] DESERVE AND WE END UP BUYING EXTERNAL EXPERTS WHO MAY HAVE THE SKILLS, BUT NOT NECESSARILY THE INTIMATE KNOWLEDGE OF OUR BUSINESS.”**

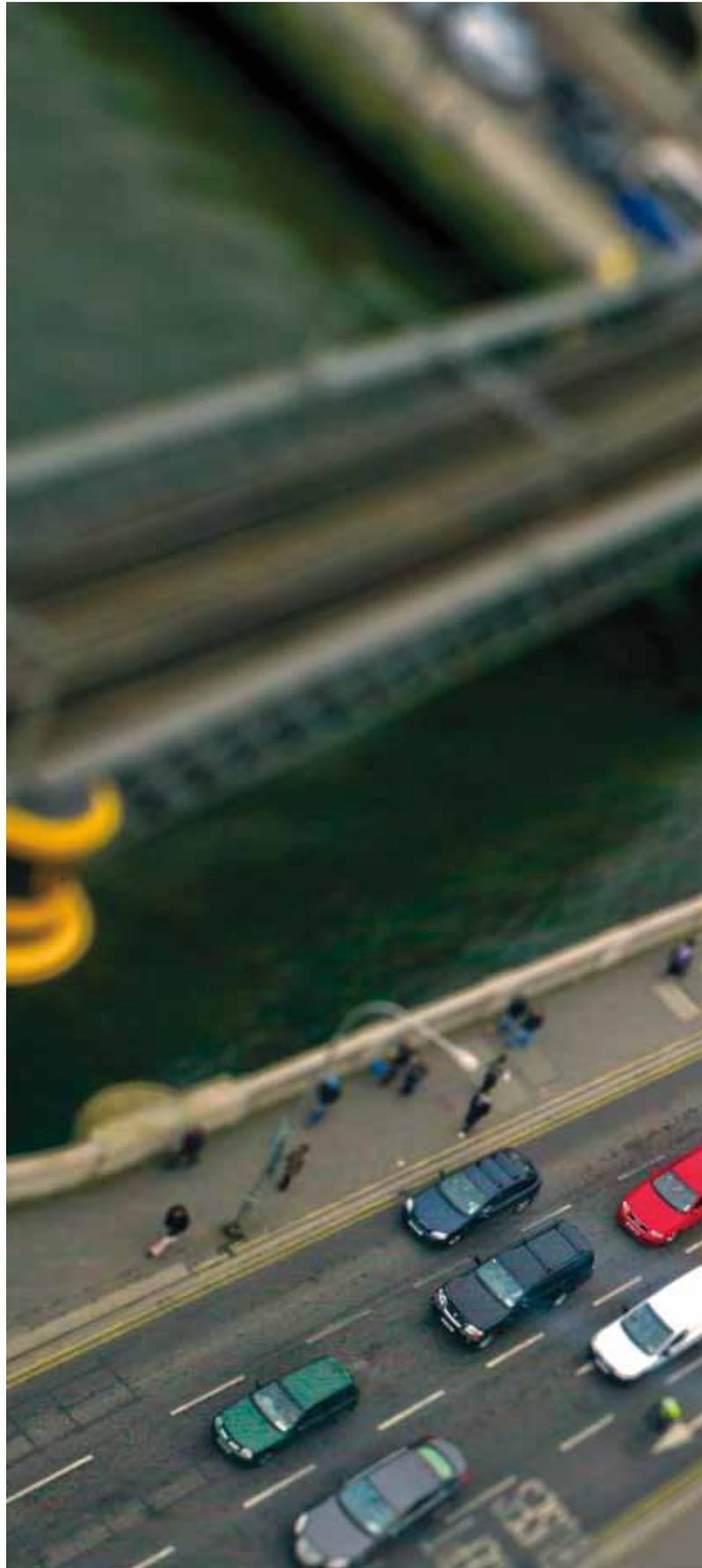
A FINANCIAL SERVICES BUSINESS, UNITED KINGDOM

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# SECTOR ANALYSIS



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# Consumer Products, Retail, and Distribution

MOBILE AND INTERNET COMMERCE DRIVES SECTOR TRANSFORMATION

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The Consumer Products, Retail, and Distribution (CPRD) sector represents a large and diverse group of companies, including consumer products manufacturers, retailers, distributors (such as logistics companies, postal systems, trucking), and transportation (including airlines, airports, and rail operators). Organizations in each of these sub-sectors have distinct technology needs. However, they are all part of the broader consumer value chain and therefore need to be extremely responsive to the changes in demand coming from the end consumer. And that consumer is increasingly empowered by technology.

Given the growing importance of technology enablement during the shopping journey – from awareness and choosing, through the transaction, and to delivery and service – the CPRD sector today is more focused on mobile and internet commerce. As a result, we expect to see an increase in testing needs for transformational projects, cloud testing, and Testing as a Service (TaaS), as well as growth in adoption of Testing Centers of Excellence (TCOEs).

CPRD companies report investing more in QA/testing than the overall market and other sectors, with 22% of total IT budget going toward the testing function. Last year, 35% of respondents in the CPRD sector said their QA budgets had increased over the previous two years; this year, 41% say it has increased and 57% say they expect to see this increase again by 2015.

This indicates that companies are continuing to invest in QA/testing in order to stay competitive and meet the high expectations of consumers. In the growing, interconnected world of consumers and customers, failure is quickly and easily communicated, so companies cannot afford to provide less than perfect products/services to customers.

A high 45% of CPRD respondents say their testing activities are with new or transformational projects, which reflects the need for innovation in this sector. Asked in which areas of QA the greatest increase in spending has occurred, 51% of companies say it is on internal professional testing resources, 45% on more investment in existing tools, and 44% on external outsourced resources.

Interestingly, when asked to look ahead to 2015 and where they thought the greatest area of investment would be, the top answer (48%) was in using external outsourced resources – perhaps reflecting the need for more specialized and specific resources required to test leading-edge services and products, such as mobile commerce.

Across all sectors and respondents this year, our survey saw the continuing growth of the adoption of TCOEs. This is also reflected in the CPRD sector, but it is clear that organizations in other sectors are taking a slightly different path. While only 6% of CPRD respondents say their in-house TCOE is already fully functional (on par with the overall figure study-wide), a further 25% say they are already developing or planning to develop an internal TCOE over the next two years. This compares to 40% of the overall survey.

The difference is apparent in the percentage of organizations planning to use a third-party company with a TCOE capability; 35% of all surveyed CPRD firms (compared to 21% overall) say they are taking this TCOE route. The scope of their ideal TCOE is broad, but executing performance testing (50%) and providing Program Management Office services (44%) are top capabilities. The key benefit in adopting a TCOE for CPRD sector firms is reducing time-to-market and reducing costs.

The growth in the impact of the cloud continues to change the way organizations approach multiple areas of their operations, and this is no different for CPRD firms. Respondents say 21% of their applications are currently cloud based, with an expected figure of 32% by 2015. Indeed, our survey suggests that the percentage of testing in a cloud-based test environment will rise by almost 50% by 2015 – suggesting CPRD firms are keen to exploit this growing methodology for their testing function.

Asked about TaaS offered by a third party, just 9% of CPRD respondents say they already use it, but 45% say they will within the next year, and a further 28% within the next two years. With 59% of respondents seeing reduced costs and 48% seeing better resource management as key benefits, TaaS appears to deliver distinct

advantages for an organization's testing. The survey also sees a predicted increase in the use of Software as a Service (SaaS) for QA/testing software licenses between now and 2015, no doubt part of the broader move towards the cloud.

Some 34% of CPRD respondents say that their organizations currently test mobile applications and devices, slightly higher than the overall figure of 31%. Given the growing importance of mobile and internet commerce, consumer/customer mobile communication and associated services, it is hardly surprising that this is an area of expected growth, particularly for the CPRD sector. However, it comes with new and additional QA/testing requirements, which many organizations are finding challenging.

So while organizations that test mobile applications focus on efficiency, performance, and functionality, there are shortcomings in those testing processes. Some 63% of CPRD firms say they don't have the right tools to test, and a further 50% say they don't have the devices readily available to test. Indeed, when asked about their key criteria for selecting an outsourced mobile testing resource, 60% of respondents say the capacity to test their application on several networks would be most important. A further 40% say the key criterion is enabling their development team to focus on development.

With the economy likely to remain challenging over the next year or so, CPRD companies will continue to explore new ways to stay competitive, while remaining innovative and attractive to budget-minded customers. New developments in mobile and web commerce will continue to offer new routes for the sector to exploit, but it must do so from a position of assurance and knowledge, as consumers are unlikely to be loyal should they be disappointed.

The rising and positive investment in QA/testing is no guarantee of success, of course. Investing in the right skills, tools, and experience will be essential to ensure that the challenges of remaining innovative and competitive are balanced with those of ensuring the levels of quality demanded by customers.



# Energy & Utilities

COMMITMENT TO IMPROVE  
QUALITY OF TESTING THROUGH  
INCREASED INVESTMENT

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**WILLEM-JAN VAN DER MEER**

Senior Test Consultant  
Sogeti

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This year's *World Quality Report* surveyed firms in the energy and natural resources sectors: oil and gas; public and private utility companies; and those involved in large-scale chemicals production.

In most parts of the world, the Energy and Utilities (E&U) sector continues to undergo major structural transformation with the liberalization of consumer electricity and gas retail markets. Utilities firms are constantly looking at how new technologies such as smart metering and smart grids can help to improve operational efficiencies as well as differentiate their service offering in a largely price-driven, commoditized market characterized by high customer churn. Consistently high oil and gas prices over the past few years have opened up new areas of exploration taking advantage of new drilling technologies.

Most E&U firms also face increased regulatory and public scrutiny regarding their ongoing operations and investments made in renewable technologies. At the point of consumption, smart metering should lead to greater collaboration with other sectors, such as telecommunications carriers and service providers.

However, IT functions within E&U companies struggle to keep pace with market change and face increasingly limited budgets, part of which is spent trying to maintain antiquated legacy systems, leaving little to spend on innovative product lines that support new customer interaction models and leverage up-and-coming technologies, as is reflected in our findings.

Energy and Utility organizations say that their testing budget has remained largely static this year, with 51% indicating that their budget is the same as last year. However, some 37% of respondents in this sector say their budget has increased to some extent, and just 8% record a decline. Respondents are somewhat more upbeat when considering how their budget will change between now and 2015, with 54% believing it will increase. This continuing commitment to improving the quality of testing through investment in both internal and external resources is characteristic of the E&U sector.

Organizations continue to recognize the importance of application standardization and quality process improvement by creating a Testing Center of Excellence (TCOE). Last year, E&U organizations were ahead of other sectors in their plans to implement a TCOE, with nearly three-quarters (74%) of respondents stating that they had either started rolling out a TCOE or had plans to do so within the next two years. However, one year later, we see a much higher proportion of E&U respondents saying that they had no plans for a TCOE – some 44% of companies in the E&U sector, compared to 34% overall.

In fact, only 5% of energy and utility firms surveyed stated that they had started to build a TCOE in the last two years, compared with other industries at 15%. Nonetheless, 43% say that they will begin developing their own TCOE or start using a TCOE offered by a third party in the next two years. This seems to indicate an apparent disparity between stated intention and the reality of developing a TCOE. When respondents were asked what they thought the greatest benefit of a TCOE would be, 38% said it would reduce time-to-market, 33% said it would reduce costs, and 30% said it would provide better resource management.

So, if firms are not developing TCOEs, where are they investing? Firstly, energy and utility firms are investing 18% of their total IT budget on testing, in line with the average across all vertical markets. There is an encouraging trend of more budget (42%) being allocated for transformational work. However, when respondents were asked where they saw the greatest increase in testing spend, 65% said it would be in existing tools, whereas it might have been thought that it would be directed more towards supporting innovative services to enhance the customer experience.

The adoption of the cloud in terms of application hosting continues to grow in the E&U sector. This is also reflected in the move towards testing in a cloud-based environment – which also shows significant uptake now and in the next few years. Respondents in this sector say that approximately one in five of their applications is now hosted or has been migrated to some form of cloud and, looking ahead to 2015, E&U organizations see this increasing to over a third. There is also an indication that the amount of testing by E&U organizations carried out in a cloud-based environment will increase over the next three years – with respondents predicting an average of 37% of their testing done this way by 2015.

Almost half (47%) of E&U respondents said they plan to use Testing as a Service (TaaS) provided by a third party within the next 12 months, which may enable firms to create added value from their QA/testing spend not allocated towards existing tools and transformational work. The primary benefits from a TaaS service cited were cost reduction (58%), followed by time-to-market (46%) and standardized testing (42%).

Hindering E&U firms from greater adoption of TaaS is the perceived “loss of control” with 41% of respondents selecting this. Although shrewd firms can navigate this issue in a strong client/agent relationship, there is definitely a perception of loss by E&U firms compared to 31% of all vertical markets.

Moving on to mobile testing, an overwhelming 65% of E&U respondents state that they currently do not test mobile applications and devices, and that the major reason is a lack of tools (68%). As consumers and customers continue to expand their use of mobile devices, and the bring-your-own-device culture gathers pace, there will be increased pressure for the E&U sectors to test mobile devices and applications as a matter of course.

Just over half of energy and utility companies (54%) use an in-house model for testing. However, a concerning 67% said that the quality of their internal onshore testing resources was only “average”, and almost half (49%) said the same for external testing resources. Combine this finding with that regarding investment mainly focused on existing tools and this would seem to indicate a preference to upgrade internal expertise, together with the development of external skilled resources via the cloud.

With the industry under much scrutiny regarding quality processes, we may see a rise in the pace of improvement of testing capabilities and standards among E&U firms in the future, and increased adoption of TCOEs.



# Financial Services

## EVOLVING QA – RIDING THE TRANSFORMATION WAVE

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The Financial Services (FS) industry, encompassing banking, capital markets, and insurance, continues to be volatile, susceptible to external events and therefore unpredictable. IT spend has followed this trend, though there is considerable focus on rationalization and legacy transformation. US-based organizations and other transnational financial institutions have applied considerable energy and effort to understanding and implementing regulatory compliance-related changes while driving growth through consolidation. Much of the rest of the market is focused on transforming their current state to yield long-term gains.

As systems change and evolve, a hybrid approach is emerging from the “build versus buy” debate – heavily customized commercial off-the-shelf systems. This is predominant in the banking sector for front office operations and in the insurance sector where middle and back office systems are automated using customized pre-built software. Capital market firms continue to focus on creating systems that stand out as differentiators, closely aligned to their products and related business processes.

As technology catches the consumer’s attention, more and more businesses across the globe are adopting newer channels, such as mobile and social media. In several cases, this has resulted in a re-evaluation of the firm’s data strategy and architectural frameworks, eliciting more change. While net funding for both discretionary and non-discretionary areas has not changed drastically, there is a renewed awareness of the need to ensure and improve quality of the end product.

This continued commitment to quality by the FS sector is evident in our survey results. The average proportion of the IT budget allocated to the testing function for FS is about 20% – more than any other sector, with the exception of CPRD. Within FS, banking and capital market firms spend more on QA.

In general, QA budget has increased over the past year, trending upwards in the forthcoming years, despite economic turbulence and slow recovery of global financial markets. The need for, and visibility of, excellence in service levels, and adoption of new or innovative products (such as mobile banking and social media), means it is likely that this commitment by FS firms will continue.

The trend towards building Testing Centers of Excellence (TCOEs) has continued to improve this year, with 6% of organizations now saying they have a fully operational TCOE. Interestingly, this was seen more in the insurance sector than any other. These firms tend to be highly decentralized (suggesting a federated model) and rely

heavily on their internal resources. Some 18% of all respondents stated that they have started developing a TCOE and expect it to be fully operational within the next two years, this trend led by capital market firms globally. A further 24% say they plan to start developing a TCOE in the next two years, the majority being banking firms.

The number of FS respondents indicating that they intend to use a third-party TCOE has crept up to 22%. The greatest benefits seen by FS respondents are reducing time-to-market (39%) and reducing costs (25%). The importance of cost optimization, increased compliance/regulatory requirements, and business growth is largely seen as the new norm. There is increasing focus by banking and capital markets firms to combine environment management with traditional testing services, whereas insurance companies are focused on cost reduction through innovative structural models.

Cloud computing has passed the so-called hype cycle, and now is considered to be a technology that brings real benefits to both IT and business aspects of organizations. FS organizations recognize the practical elements of the cloud, cloud-based services, and applications, as ways to avoid ongoing costs such as building and maintaining their own data centers. This has resulted in revolutionizing the way test environments are designed and operated, with QA organizations taking a lead in the definition of their strategy.

While there are still concerns about security and scale, there is a definite move toward using the cloud. Just 14% of FS respondents say they are not going to migrate any applications to the cloud (down from 16% last year). This year, some 79% of FS respondents say that 11-50% of their applications have been migrated or are hosted on the cloud, compared to 58% last year.

Indeed, the amount of testing carried out via a cloud-based environment is set to increase between now and 2015. There is a significant improvement since last year: some 60% say that up to 30% of their testing now occurs this way (and only 4% say none). Banking firms lead this trend in North America, whereas in Europe, capital market firms show the way.

Insurance organizations in general are more focused on extending existing tools, whereas banking/capital markets firms are keen to identify newer products that would yield higher benefits.

More than 60% of organizations intend to use Testing as a Service (TaaS) offered by a third party within the next 12 months, and a further 33% say they will do so over the next two years, indicating

that TaaS obviously resonates with the FS sector for the broad advantages it brings. FS respondents are looking to reduce costs (61%), get better resource management (50%), and cut their time-to-market (41%) by adopting TaaS. FS organizations in the Asia Pacific region are currently lagging behind their counterparts in mainland Europe, UK, and North America, but this picture might undergo a revision next year as awareness around TaaS increases. In general, insurance firms seem keen to adopt TaaS in the next 24 months, as compared with their banking and capital markets counterparts.

One area of increasing attention for all sectors, and particularly within the banking industry, is the growth of mobile banking and mobile commerce, and the need for appropriate testing. Integration with current systems and validating usability and performance needs to be addressed within the IT environment. Some 31% of FS respondents say they currently test mobile applications and devices internally. Western European firms seem to have a lead on this across all sectors. There are significant challenges: 72% of respondents say they don't have the right tools to test mobile applications, 50% don't have the mobile devices readily available, and a further 38% have no mobile testing experts available.

Clearly, then, there is a shortcoming in the in-house ability to test mobile applications, and we can expect that gap to be filled through outsourcing. Indeed, when asked what would be the key criterion in choosing an outsourced solution to mobile testing, some three-quarters of respondents say it would be the capacity to test their application on multiple networks. Defining a strategy and roadmap for mobile testing is a critical first step for organizations that have just joined the bandwagon.

As worldwide financial markets continue to recover, we expect to see ongoing commitment to quality, modernization, and innovation by FS companies. Quality assurance at insurance firms is increasingly focused on reducing cost and enhancing existing capabilities. Banking and capital markets firms are market driven; their QA is focused on acquiring new capabilities, while increasing its overall scope.

QA transformation should therefore be led by an increased focus on cost optimization, improving testing tools and skills, and focus on moving quality to the left of the development lifecycle. These should be evidence of the essential importance FS companies continue to give to software quality

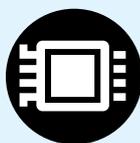


# High Tech

## INCREASING FOCUS ON DATA-DRIVEN CUSTOMER SERVICE DELIVERY

BY **JEAN-PIERRE HERVÉ**

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The High Tech sector extends across a diverse range of companies involved in the design, manufacture, and support of components such as semiconductors and software used in telecommunications equipment, transportation, and defense systems, including the networking and systems architecture. This sector is a fiercely competitive one, with the pace of change faced by High Tech organizations being perhaps more significant than in any other sector. Partly driving this change is the rapidly evolving nature of the relationship and interaction between consumers and organizations – not least the growth of mobile technology that has allowed consumers to interact with organizations using smartphone and tablet devices to an ever-greater extent. This has meant increased focus on, and investment in, systems that help improve that customer interaction and make better use of the data collected for marketing and sales purposes.

Given their nature, High Tech organizations have always traditionally maintained a high level of quality in their internal applications, and it is largely ingrained in their operations. However, the growing pace of change in the sector, and in particular of mobile technology, means that consumer-facing applications are becoming increasingly the focus for QA efforts. High Tech sector organizations are at the leading edge of the change in how consumers, citizens, and organizations interact – how they shape their QA approach in the coming years will help determine how other sectors also focus on mobile and web testing.

In 2012, companies surveyed in the High Tech sector are increasing their total investment in the testing function and expect to continue that to 2015. Some 41% of High Tech respondents say that their testing budget has increased this year, compared to 38% in 2011. Looking ahead to 2015, some 57% say that their budget will continue to increase – with 15% saying it will be a significant increase, compared to just 8% of the overall study. Clearly, the pressures, driven partly by fierce competition and also a zero tolerance of failure, will mean a continued focus by High Tech companies on QA/testing.

Indeed, 56% of High Tech companies say they currently intend to invest more in 2012 in improving and developing existing testing tools to maximize their usefulness. However, by 2015, High Tech respondents predict the top two areas of investment will be test environments/infrastructure (50%) and new testing tools (45%).

These figures are far beyond other sectors, with just 22% of all the other sectors indicating they will be investing in new testing tools by 2015; so it is clear that High Tech companies will be leading the way to meet the fast pace of innovation and fierce competition they face.

High Tech companies also continue to push hard in the development and adoption of Testing Centers of Excellence (TCOEs), with a quarter of respondents planning to develop an internally managed TCOE within the next two years, and a further 17% planning to use a third-party company (up from 8% last year). What are companies in the High Tech sector looking to gain from setting up a TCOE? Principal reasons given are reduced time-to-market (30%), improved quality (29%), and better resource management (28%).

The level of industry maturity found in the High Tech sector helps to explain the high levels of cloud adoption. Last year, 56% of High Tech respondents said that they planned to migrate 11-50% of their applications to the cloud. This year, some 62% say that 11-50% of applications are now hosted or migrated to the cloud and a further 9% predict that by 2015 more than 50% of their applications will be hosted or migrated to the cloud.

This appears to indicate that this mature sector recognizes the advantages of moving into a cloud environment and is keen to exploit those opportunities. Technology vendors are very familiar with the concept of service delivery through shared networks, and have been among the earliest adopters of cloud computing.

Technology companies are also well positioned to judge the relevance of these technologies to their business models, and which applications are best suited to be used in the cloud. Indeed, looking forward to 2015, two-thirds of respondents within the High Tech sector believe that more than 30% of their testing activity will be done in a cloud-based environment.

Testing as a Service (TaaS) offered by a third party is an area that High Tech sector companies are looking to leverage over the coming years. Some 13% report that they already use the service, 43% say they intend to use it in the next 12 months, and 31% in the next 24 months. High Tech respondents report that the benefits to them of using TaaS are reduced costs (61%) and reduced time-to-market (50%).

A growing area of focus for all sectors is the testing of mobile applications and devices. As more mobile devices enter both the consumer and business arenas, there is a growing need to ensure that the applications run on the devices smoothly and link seamlessly with other existing systems.

Some 30% of High Tech respondents say they currently test mobile applications and devices, and those that do say they face significant challenges in terms of not having the right tools (62%) and not having the right testing process/methods (50%). These challenges will inevitably become less significant over time, but at this juncture there is clearly a significant gap that will need to be bridged.

Indeed, when a High Tech company considers an outsourced resource for mobile application testing, some 62% of respondents say the key criterion is that it allows their development teams to stay focused on development.

As the economy recovers and new markets continue to expand in complexity and demand, there is an expectation that High Tech companies will continue to invest in applications and platforms that help them to better respond to demands made of them, both internally and externally. These companies have always been among the earliest adopters of emerging technologies, and this position continues to be reflected in their approach to QA and testing.



# Public Sector

## RENEWED FOCUS ON EFFICIENCY GAINS LINKED TO BUDGET REDUCTIONS

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The pace of technological innovation, strong demand for customer-centric processes, and the need for ever-greater efficiency are resulting in profound changes within the Public Sector. While many governments in developed countries are cutting public spending as they attempt to reduce deficits or debt, those in rapidly developing countries with fast-growing economies face the challenge of improving tax compliance and social welfare provision in order to support social development and reduce inequality.

Technology continues to enable improved performance and greater efficiency in all areas of government. Automating processes, applying business analytics to yield insights from large volumes of complex data, making services available to citizens via online channels, and replacing traditional client-server infrastructures with cloud-enabled models are just some of the strategies that Public Sector organizations are pursuing in order to modernize their operations. Freeing up resources and reducing running costs are common goals, but so, too, is the need to offer citizens simpler and more integrated services.

While large-scale Public Sector IT projects have always been subject to close scrutiny, the renewed focus on value for money, brought about by the debt crisis, means that the stakes are now higher than before. Implementing new systems and processes smoothly and successfully the first time is more vital than ever. This perhaps explains why most respondents this year actually report an increase in the percentage of their total IT budget that is invested in their QA/testing functions, despite downward budgetary pressure.

While Public Sector organizations across the world face reduced budgets and increased demands to do more from less, almost half of respondents this year actually report an increase in the percentage of their total IT budget that is invested in their QA/testing functions. Over half of Public Sector respondents expect their QA/testing spend to increase over the next three years. This may represent a renewed focus on ensuring applications and services are delivered on time and without error, since mistakes and delivery failures are now a matter of intense public focus and scrutiny.

Indeed, the greatest challenge Public Sector organizations report regarding their QA/testing activity is that of changing business requirements. However, fully 30% of respondents do not believe their QA budget will increase between now and 2015.

Asked about the areas of QA where there is currently the greatest increase in spending, Public Sector respondents cite investment in existing testing tools (58%), external outsourced resources (45%), and internal professional testing resources (45%). However, when asked to look ahead to 2015, we can see significant changes. While there is still predicted to be a large focus on investment in existing tools (48%), there is a significant increase in the investment in test environments (44%) and new testing tools (44%); indeed, the level of investment in new testing tools is double that of the global average.

This changing focus of investment may reflect the increasing importance of Testing Centers of Excellence (TCOEs) to the Public Sector. Some 19% of Public Sector organizations say they already have a TCOE fully or partly operational. A further 52% plan to start using a TCOE over the next two years, 30% say they will develop an internal TCOE, and 22% say they will use a third party. Our Public Sector respondents believe that a TCOE will help reduce costs and improve their speed/agility to support organizational objectives.

This year, as with last year, our survey shows that the cloud is a significant element of Public Sector thinking regarding applications and testing. In 2011, nearly half of our respondents said that they were planning to move 11-50% of their applications to a cloud environment. This year, some 60% of respondents say that, by 2015, 11-50% of their applications will have been migrated or hosted in the cloud.

The nature of Public Sector organizations makes the adoption of cloud (with private cloud infrastructure probably predominating) a sensible approach to the interconnection and sharing of information. Linked to this move to the cloud for applications and that of TCOE adoption is a growing use of testing in a cloud-based environment, with the percentage of testing done by Public Sector organizations via this method expected to be 38% by 2015. The challenge, of course, is to develop the QA necessary to ensure that such a move to the cloud is carried out while removing the risk of significant application failure, which tends to be very public and highly damaging.

Testing as a Service (TaaS) also continues to grow in importance to Public Sector respondents. While 13% say they already use TaaS offered by a third party (compared to 11% overall), a further sizeable 53% say they will start to use TaaS in the next 12 months, and 27% within the next 24 months.

The benefits that respondents believe they can achieve through TaaS are reduced costs (56%) and better resource management (49%). As part of the Public Sector's wider attempts to significantly cut their costs, whilst still improving their QA/testing function, this would therefore seem an attractive option.

Equally, and with regard to their QA/testing software licenses, Public Sector respondents see the use of Software as a Service (SaaS) as a way to reduce costs yet maintain access to specific tools. They also forecast that, by 2015, up to 43% of their QA/testing software licenses will use the SaaS model, in which licenses are paid for only when being used.

A growing area of activity that all organizations have to take into account is the proliferation of mobile applications and devices, and the challenges of ensuring that services work across all platforms and devices. Just 27% of respondents from the Public Sector say that they currently test mobile applications and devices, compared to 31% overall. With the growing importance such devices play in the everyday lives of citizens, it is clear that mobile communication is important, not just for consumer-oriented organizations, but governments and public bodies too.

However, the internal existing testing and QA function within the Public Sector may not have the right skills or environments to test these devices and applications. Indeed, some 64% of our Public Sector respondents report that they do not have the right tools, and a further 51% say they do not have the devices readily available. Given the significance of mobile communication in citizen interaction with Public Sector organizations and the rise of a bring-your-own-device culture, this is an area that will demand greater attention and quite possibly the use of specialist testing skills outside the organization.

The findings in the *World Quality Report 2012-13* for Public Sector organizations show significant commitment to improving their internal testers and testing tools – it is clear that they are turning to external resources for specialist requirements. The development of TCOEs and the increasing take-up of both TaaS and SaaS show that third-party involvement is seen to be essential to both reducing costs and improving levels of QA/testing.



# Telecoms, Media, and Entertainment

MAXIMIZING ASSETS, UNLEASHING GROWTH, AND TRANSFORMING TO SUCCEED

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The Telecoms, Media, and Entertainment (TME) sector includes a variety of telecoms businesses such as internet, cable, and mobile service providers, as well as network equipment suppliers and media and entertainment companies. It is fair to say that TME is among the fastest-paced and most innovative industries, with companies continuously revising their business models, offering new packages, and bringing additional services to their clients. In just a few years, telecoms companies have shifted from offering separate landline and mobile phone services to delivering multi-play bundles that include everything from mobile apps to broadband internet and even TV.

In that context, for any telecoms service provider nowadays, the relationship with the customer is critical. A weak customer relationship management (CRM) system could lead to rapid loss of customers, breaches in data security, damage to the brand, and soaring costs.

Yet the support systems of many TME companies are being pushed to their limits more than ever before. In order to remain competitive, telcos need to provide multiple services over a range of devices, engaging with their customers across mobile and internet platforms in real time.

Failure to put in place a robust and evolving testing environment risks not keeping pace with fast-moving service environments and also damaging the customer experience. Conversely, sufficient investment in a testing and quality assurance strategy will enable organizations to reduce costs, standardize processes, and improve service quality and time-to-market.

Testing of mobile applications and those in the cloud is on the rise, as is the process of consolidating outsourced partners and testing practices into centralized and standardized Testing Centers of Excellence (TCOEs).

This year's report confirms that companies in the TME sector are continuing to increase their QA/testing budgets to maintain their drive towards a better quality of service, although the outlook for this growth is less optimistic than in the past. Last year, 54% of TME respondents said that their QA budget had grown over the past two years. In 2012, this has fallen. Some 48% respondents say that

their QA budget has increased over the past year, and 51% predict that it is likely to grow again by 2015. This reflects the need for companies in the sector to react to continued fast-paced innovation and competition by ensuring their service levels and delivery are without fault.

As noted last year, TME companies are beginning the process of consolidating their outsourced partners and testing practices into centralized and standardized TCOEs. While the number of TME companies who say they have a fully functional TCOE has only slightly increased from just 4% last year to 6% this year, the vast majority of respondents (65%) report that they are currently working on developing a TCOE or have plans to do so within the next two years.

The timing may be ambitious, but the intent and desire to gain the benefits of an active TCOE are quite clear to respondents – and unsurprisingly, given the dynamics of the TME sector, a reduction in time-to-market is seen as the most significant benefit of all.

Cloud continues to spread into various activities in an organization, and the QA/testing function is no different. Respondents among TME companies say that the amount of testing done in the cloud will rise by 12% between now and 2015. Indeed, they predict that this will rise to a third of their applications that are migrated or hosted in the cloud by 2015.

Testing as a Service (TaaS) offered by a third party is an increasingly utilized option. With 12% of respondents saying they already have TaaS in place, and a further 48% reporting that they plan to use TaaS within the next year, we can see a definite move towards TaaS in this sector. Indeed, only 6% of TME companies say they have no plans to use TaaS, well below the global average of 11%.

Why has this sector adopted this model so wholeheartedly? Well, our survey suggests that TME respondents see TaaS as offering a way to reduce costs (58%) and develop better resource management (51%). The survey also shows a similar move towards using QA/testing software licenses exploiting the Software-as-a-Service (SaaS) model, by which organizations only pay for licenses when they are

being used. TME respondents report that 36% of their QA/testing software licenses use this model currently, but that this will rise to 48% by 2015.

A growing area of focus for all sectors, but obviously of particular interest for TME companies, is that of mobile application testing. Some 30% of TME respondents say they are currently testing mobile applications and devices. Since one of the most significant challenges to testing mobile applications cited by our respondents is that of not having the right tools to test (62%), we can expect an outreach for specialist expertise in developing mobile application testing. Indeed, 58% of TME companies surveyed say that if they were to look at outsourcing their mobile testing, their key criterion for choosing to outsource would be to keep their development team focused on development.

The TME sector continues to grow at a faster pace than most other sectors, driven by the decline of monopolies and growth of non-traditional actors, which has meant service providers have to compete for customers more vigorously. The rapid pace of innovation, new product development, and roll-out of 4G/LTE technologies will continue to fuel this competition.

This means additional demands for IT and testing to ensure that there is a seamless link between the various technological components. To meet these demands and win and retain customer loyalty, companies will need to ensure their QA/testing is fit for the task and agile enough to cope with the growing and changing demands made of them.

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# COUNTRY AND REGIONAL ANALYSIS



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**56** Australia and New Zealand

**58** Brazil

**60** China

**62** France

**64** Germany

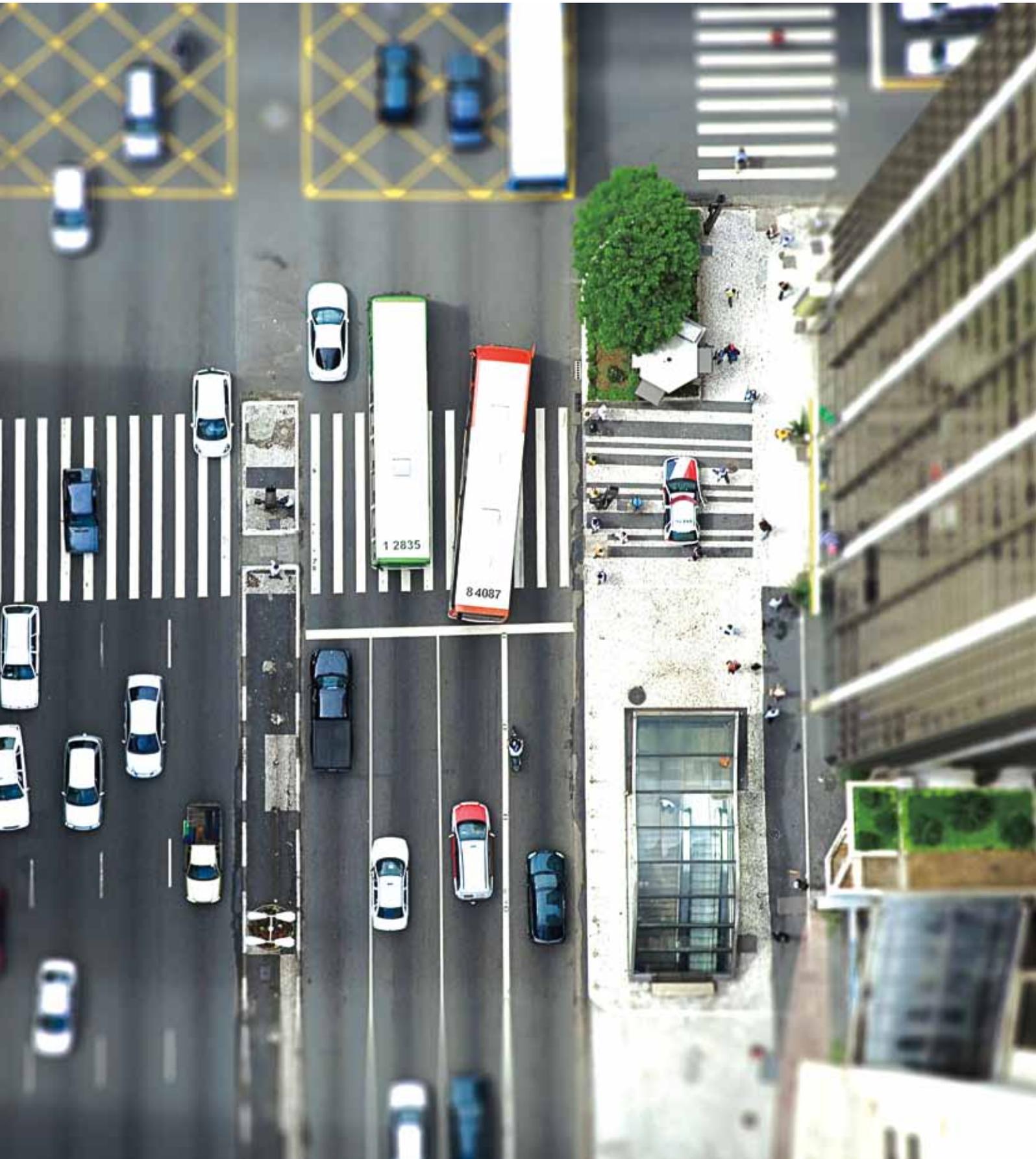
**66** The Netherlands

**68** The Nordic Region

**70** North America

**72** United Kingdom







# Australia and New Zealand

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## Top Trends

- There has been a significant move toward the development of Testing Centers of Excellence (TCOEs).
- 72% of Australian respondents say they do not have the right tools to test mobile applications and devices adequately.
- Australian organizations using Testing as a Service (TaaS) offered by a third party are set to increase significantly.

Australia is a truly dynamic market, with a competitive, industrialized economy underpinned by a strong service sector, and has avoided much of the pain of global financial contraction. Key organizations still need to plan strategically, act with caution, and optimize spending on processes and productivity in order to ensure they stay ahead of global and local competition. Major players are focusing on transformational projects, to increase efficiencies and achieve operational gains so that QA remains a key lever to generate measurable benefits, while also looking to control change in the IT ecosystem.

Some 60% of respondents in Australia (compared with 51% globally) prefer to use an onsite testing resources engagement model, as opposed to nearshore or offshore resources. However, only 27% rate the quality of their testing resources as above average. With the market changing rapidly and the desire to use new applications for enterprise gain, there has to be a drive to lift the quality of onsite testing resources or look to trusted providers for additional skilled resources.

One challenge faced by many organizations is that of structuring the testing function for optimized delivery. Only 8% of Australian respondents (equal to that of all other countries) use a testing function centralized across the organization, and around half use a mix of decentralized and centralized testing. This often leads to the question of who really owns the testing activity, which in turn can lead to underperformance and suboptimal development.

Getting quality development delivered on time provides further challenges for Australian enterprises: lack of defined testing processes and metrics (32%); lack of overall coordination between business and development teams (30%); poor development/coding standards (27%); and lack of overall coordination between business and testing teams (28%).

However, we also see that change is in progress, with a significant trend towards the use of Testing Centers of Excellence (TCOEs) to drive down testing/development time, reduce cost, and also improve overall resource usage. Only 34% of Australian respondents have no plans to implement a TCOE – down from a very high 63% in 2011 – with 22% planning to have an internal TCOE operational within the next two years.

Australia reports one of the highest levels of current TCOE usage, with a focus on Program Management Office (PMO) services, together with training and knowledge management and control of testing methodology and processes. Having seen that the quality of internal testers is at best average, there is a clear drive to lift the overall quality of the testing process. Achieving innovation through the sharing of people, processes, and tools in a TCOE can also increase overall productivity.

The major driver for introducing a TCOE is cited as being the desire to reduce time-to-market for core developments and the improvement of resource management. TCOE is not just about cost reduction, and indeed this is seen as only a minor benefit.

Views on budgets indicate a strong commitment to testing. The average proportion of IT budget invested in testing is the same as the global average of 18%. While it could have been higher – taking into account the strength of the Australian market – it still indicates an underlying commitment, supported by analysis of where the budget is invested. Some 45% of the budget, compared with 41% globally, is being invested in new transformational projects, as opposed to maintenance work, and some 58% on customer-facing activities, as opposed to employee-based ones. The QA areas for greatest investment in 2012 will be in existing testing tools, external outsourced resources, and test environment/infrastructure.

Looking at actual testing activity in more detail, 60% of firms agree that they consistently measure QA metrics across the entire company, but methods of measurement vary greatly. Only one in 10 Australian firms uses industry-standard estimation methods; around a quarter of firms use in-house-developed estimation methods, and 30% take a percentage of the development effort.

This may reflect an increasing maturity in terms of testing, or simply an added focus on metrics. Either way, there is still room for improvement – in our opinion, there is still too much manual

collection and reporting of data. The market also accepts that it needs to mature, because, when questioned on the ideal percentage of automated test cases, the response is 40%, while companies currently only achieve 32%.

Another key trend identified is the move to cloud-based activities. Currently 24% of testing is in a cloud-based environment, but this is estimated to grow to 36% by 2015, by which time, it is estimated, those making the move to the cloud will have done so. Testing as a Service (TaaS) will also see significant acceptance in the next two years. Some 19% of Australian respondents (higher than the 11% global average) report they already have TaaS offered by a third party. Looking ahead, 38% expect to use it in the coming 12 months, and a further 24% in the 12 months after that – a significant increase over the next two years. Only one in five Australian companies reports they will not be using TaaS.

The key drivers for the increased use of TaaS include cost reduction, better resource management, and reduced time-to-market, with only limited challenges being reported, which center on loss of control over the total testing spend (mentioned by a third of Australian firms) and security issues.

Mobile applications and devices are also set to change the way organizations operate, driving greater functionality and productivity. But this demands additional testing, and, to date, only 39% of respondents report that they are undertaking testing on any mobile application or device – still higher than the global average of 31%.

The key reasons for the lack of mobile testing are that organizations don't believe they have the right tools, mentioned by 72%, while 39% don't have the appropriate mobile devices available. Mobile testing will be a critical area of development in the next few years as mobile application development grows rapidly. Robust testing is crucial to a smooth customer experience.

For those respondents who do test mobile applications, testing effort is focused on application efficiencies and performance (including network performance), portability (various mobile devices), and functionality. If mobile testing is outsourced, the key criterion identified for selecting an outsourced vendor is the ability and capacity to test applications on several networks. Finally, in terms of ensuring that the applications are secure, a higher percentage of Australian firms than global ones leave the function to information security, but one in 10 say they have no primary owner.

Looking forward, there is clear evidence in the Australian market that the focus is now on new and emerging technologies to generate the organizational and productivity efficiencies required, and that these include increased mobile application and device usage, bring-your-own-device, and controlled use of the cloud.



# Brazil

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## Top Trends

- The high level of investment in QA is set to continue.
- Testers are kept close to the organization, with constant interaction between parties.
- Movement toward testing in the cloud is growing.

Brazil, now positioned as the sixth largest economy in the world, continues its rise as a dynamic and flourishing economy. While its growth rate has been impacted by the global banking crisis and resulting economic turmoil, Brazil remains a robust market and is likely to become stronger as the global recovery picks up. Indeed, with strong inward investment, significant oil and gas discoveries, large-scale government initiatives, and investment in infrastructure (upcoming World Cup and Olympics), analysts widely predict that it could soon become the fifth largest global economy.

As the Brazilian market continues to grow in both size and reach, so its testing services continue to mature, with increased focus on resources and investment. The majority of organizations prefer to keep their testers very close to the organization. Some 56% of respondents in Brazil say their testers are internal. Indeed there's a major preference for testers to remain close to the business, with some 62% saying that onshore is the preferred location (compared to 52% of the global market). Whilst more organizations are likely to use offshore/nearshore testers than last year (38% this year versus 30% in 2011), it is still below other geographies, and reflects the growing maturity of the Brazilian market. This analysis indicates a view of a market in which testing services are closely aligned with the end-users and require constant interaction between the parties.

It is interesting to note that, in contrast to the overall average for the study, Brazil rates the quality of its internal testers far higher than other countries do. Some 45% of companies say that their internal testers' quality is better than average – compared to just 23% of the overall market. Brazilian organizations also rate the quality of their external testers far higher than the overall market – suggesting a continued move towards external testing, despite the confidence in in-house testers.

Further evidence of this commitment to developing and improving testing can be seen in budget allocation – most clearly in the percentage of IT budget allocated to the testing function. Brazilian respondents cite a figure of 25% – far higher than any other geography (global average is 18%). Despite the difficult global economy, 37% of Brazilian respondents say their QA budget has increased over the last year.

Indeed, 55% say they expect it to increase slightly or significantly by 2015. It is encouraging to note that 48% of the budget is allocated to new, innovative or transformational work (compared to 41% globally), further supporting the drive for quality, innovation, and growth by Brazilian organizations.

While our observation of the Brazilian market shows that testing is, in many cases, still rather immature, our survey shows there is a continuing trend to increase the level of testing expertise and skills. Where are Brazilian organizations looking to increase spending in their testing budget? Right now, 55% say it is on their existing testing tools and 48% say it is on internal professional testing resources. Looking ahead to 2015, respondents still expect to spend on improving their internal professional testing resources (52%), but also foresee significant investment in external outsourced resources (46%) and new testing tools (37%).

This investment in improving the sophistication of testing and QA metrics is necessary, as much is still done manually and without automation. Almost double the amount of respondents from Brazil (40% versus 21% globally) say their QA metrics are collected and shared manually using Excel.

While only 12% of respondents from Brazil (compared to 21% of the total respondent base) say they have already started an in-house Testing Center of Excellence (TCOE), 51% say they plan to develop an internally managed TCOE or use a third-party company. Indeed, last year, 29% of Brazilian organizations said that they planned to develop their internally managed TCOE within two years. This year, that figure has risen to 35%.

While organizations may slip on the timing, this represents a significant move towards developing and adopting a TCOE. What will be involved in the scope of these TCOEs? Fully 60% of respondents say that training and knowledge management of testing activities will be their top priority, followed by execution of functional testing (54%) and providing Program Management Office services (51%).

Turning to the cloud, we reported last year that organizations were keen, if cautious, in their move towards using the cloud as a testing environment. In 2012, we see this trend continuing, with just 16% of respondents in Brazil saying none of their testing currently

uses the cloud as a testing environment. This figure is expected to fall even further to 6% by 2015, showing a significant adoption of the cloud as a testing platform.

The predicted increase in the percentage of testing that occurs in a cloud-based environment will be nearly half of all testing activity by 2015 – higher than the overall global figure of 39%. Despite their reservations, Brazilian organizations expect the percentage of applications to be hosted or migrated to the cloud by 2015 to increase by 55% – significantly higher than that of the overall figure for the survey.

While 29% of Brazilian respondents say that they have no immediate plans for deploying Testing as a Service (TaaS) offered by a third party (compared to 11% of the overall global figure), 59% say that they plan to start using it within the next 24 months. Although organizations may not have adopted this model so far, there is clearly a significant proportion of the market looking to TaaS as a way to reduce costs, better manage resources, and reduce time-to-market. Further, while there seems to be a growing realization that deploying a TaaS model can help reduce infrastructure and software license costs, and bolster the lack of mature testing skills within the organization, the research found that the desire to have the testers close to business operations may prove to be a barrier for many organizations surveyed.

Just over a quarter (26%) of Brazilian organizations say they are currently testing mobile applications and devices – compared to 31% globally. What are the greatest challenges to organizations in testing mobile applications and devices? Nearly two-thirds (65%) say that they don't have the right tools to test appropriately, a further 35% indicate they don't have the right testing process/method, and 35% say they don't have time to test.

Clearly, given the growing sophistication of the Brazilian market, mobile testing will become a necessary requirement of organizations with heavy consumer/citizen exposure. Finding the right skills, the right resources, and the time to test mobile applications and devices will become increasingly critical to business success.

The Brazilian market is clearly maturing in its approach to QA and testing, with an ongoing and expanding commitment to investment in IT in general and in testing specifically. This is starting to show dividends, and, in a more competitive environment, the quality of business products and services will become a key factor for organizational success. Looking ahead, Brazilian organizations will continue to mature as they move along the path of testing in order to realize tangible benefits from their QA activities, while adopting new models and technologies along the way.



# China

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## Top Trends

- Increased investment in QA/testing functions is focused on improving internal resources and the use of external expertise.
- Developing a Testing Center of Excellence (TCOE) is seen as a way to catch up with more mature testing markets.
- There is continued and strong interest in the use of cloud services.

China is the world's second largest economy after the United States. It is the world's fastest-growing major economy, with growth rates averaging 10% over the past 30 years. China is also the largest exporter and second largest importer of goods in the world, and is second to the US in the value of services it produces.

The provinces in the coastal regions of China tend to be more industrialized, while regions in the hinterland are less developed. As China's economic importance has grown, so has attention to the structure and health of the economy. The government's twelfth Five-Year Plan, adopted in March 2011, emphasizes continued economic reforms and the need to increase domestic consumption in order to make the economy less dependent on exports in the future.

As part of this rapid advance of China as a key and leading economic player, Chinese companies are very aware of, and seeking to address, real or perceived gaps in their QA/testing functions. Chinese companies continue to grow their investment in QA and testing, with 20% of their total IT budget going to the testing function (compared to 18% overall). Indeed, the investment level has increased slightly or significantly for some 50% of Chinese respondents since 2011.

There is little sign that this commitment to QA/testing will slow, as a further 60% say the same is likely through 2015. When asked which areas of QA are seeing the greatest increase in spending, they say that more investment in existing tools (47%), internal professional testing resources (45%), and external outsourced resources (41%) take the lead. Looking ahead to 2015, Chinese respondents say the leading area of spend will be test environments/infrastructure (51%). Clearly, Chinese companies are seeking both to improve their internal expertise and to make use of external resources to drive up their levels of QA excellence.

While the level of fully operational Testing Centers of Excellence (TCOEs) remains below that of the global picture, Chinese companies are well on the way to developing and adopting the TCOE concept. Last year, we reported that 84% of Chinese organizations planned to set up a TCOE within the next two years (either developed internally or using a third party). This year, 36% report that they have begun developing an in-house TCOE (but yet to be fully functional), which is more than double the 15% of companies globally. A further 24% of organizations aim to develop an internal TCOE within the next two years, and 22% plan to use a third-party company. Chinese companies are clearly keen to invest, in order to catch up with the more mature markets, and they see the adoption of TCOE as a means to reduce time-to-market, reduce costs, and improve resource management.

Chinese respondents are among those most interested in exploiting the cloud, with some of the highest rates of adoption seen in our study. Last year, 69% of Chinese companies expected 11-50% of their applications to be hosted or migrated to the cloud. This year's study shows some 74% of Chinese respondents expect that 11-50% of their applications will be migrated to the cloud over the next three years.

Indeed, Chinese companies report that an average 25% of their applications are already hosted in the cloud, with an average of 32% predicted by 2015. This latter figure is very much in line with the global average predicted for 2015, by which time it is likely those applications that can be moved to the cloud will have already been moved. This move to the cloud is also reflected in specific testing functions, with Chinese respondents saying that a third of testing now occurs in a cloud-based testing environment. This is predicted to increase slightly between now and 2015, but again appears to have reached a "capped" level (39% of testing) – in line with expectations globally.

Associated with this strong adoption of cloud and cloud-based services and the drive for improved QA/testing resources, Testing as a Service (TaaS) and Software as a Service (SaaS) continue to show

solid take-up among Chinese companies. While just 11% of Chinese respondents (in line with the global average) use TaaS currently, our report shows this will change significantly over the next two years. Nearly half (47%) of all Chinese respondents say they plan to use TaaS over the next 12 months, with a further 37% saying they plan to use it over the next 24 months.

What do Chinese companies hope to achieve through their use of TaaS? A large majority of them (70%) are seeking to reduce their costs, with a further 57% seeking better resource management, and 39% looking to standardize tracking of projects through metrics. Among Chinese companies, SaaS is also increasingly important – with respondents saying that, by 2015, 44% will adopt the model of only paying for QA/testing software licenses when they are being used. All of this demonstrates a rapidly maturing QA environment.

Of growing importance to both consumers and organizations is mobile technology and its associated applications and services. This explosion of mobile devices and applications has led to a revolution in communications, interaction, and commerce, but also offers fresh challenges to QA and testing. Some 30% of Chinese respondents (in line with the overall figure) indicate they currently test mobile applications and devices – but even among those who do, there are significant areas of concern. Some 79% of Chinese companies who currently test mobile applications say that they don't have the right tools to test, and a further 34% say they don't have mobile testing experts available. It appears that organizations may need to find new resources and skills to ensure the proper level of attention is given to this important aspect of testing.

In summary, our report shows that, to add excellence of quality to the fast-paced Chinese economy, Chinese companies are rapidly moving along the path of QA and testing maturity. The continued investment in QA budgets in general, and adoption of specific, specialized skills and resources that further lift and develop QA levels, will bring world-class, quality practices and leading-edge technology to Chinese organizations.

**74%** of respondents expect that up to 50% of their applications will be migrated to the cloud over the next three years



# France

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## Top Trends

- 24% of French respondents plan to develop an internal TCOE within the next two years.
- A third of testing is done in some form of cloud-based testing environment.
- There is dramatic growth of mobile application and device testing.

In last year's *World Quality Report*, we remarked that the French economy has proven to be more resilient than many other countries during the recent economic crisis. France, the second largest economy in the euro zone after Germany, is now facing a public finance squeeze. In the private sector, there continues to be much evidence that firms are expecting to increase their IT budgets, with a continued focus on new projects and infrastructure transformation.

In this year's report, French respondents indicate that their testing budget represents 21% of the total IT budget, higher than that in the rest of Western Europe and globally. Some 68% of French companies also report an increase in their QA budget over the past year. A further 56% predict an increase between now and 2015. However, 29% say that their QA budget is likely to decrease slightly or significantly between now and 2015. This perhaps represents a general ongoing cautiousness regarding the wider European economic situation over the next few years.

Where do French respondents see the greatest level of QA investment now and over the next three years? Some 47% of French organizations say that their current increase in spending is in existing testing tools, 45% in internal professional testing resources, and a further 40% say it is in external outsourced resources. By 2015, this changes, with the greatest investment in external outsourced resources, then internal professional testing resources and test environment/infrastructure. This may represent the continued twin drive of improving internal resources while also making use of external resources for specialized or specific testing requirements driven by technological developments.

French respondents seem to take a slightly different approach to the development of Testing Centers of Excellence (TCOEs) than the overall study. Some 40% of French companies indicate they have no plans in place to develop a TCOE (compared to 34% overall and 21% in Germany). However, a significant majority either plan or have begun to develop/use a TCOE. Some 24% plan to develop an internal TCOE within the next two years, 14% plan to use a third-party company, and a further 14% have begun development of an internal TCOE.

The main areas included in the scope of French TCOEs are training and knowledge management of testing activities (49%) and control over testing methodology and processes (45%). The key benefits for French respondents are improved QA agility/time-to-market (66%), better quality (38%), and reduced costs (32%).

The growing role of cloud computing in organizations throughout the world is echoed here in France. While local laws and regulations regarding data hosting and security undoubtedly shape the pattern of national cloud computing uptake, French organizations already see the potential and are exploiting it. Last year, nearly half of all French companies surveyed said that 11-50% of their applications would be hosted or migrated to the cloud (including both public and private clouds). This year, that figure has risen to 65%, and French respondents believe this will continue to increase.

When asked to look to 2015, 18% of respondents expect that more than half of their applications will be hosted in the cloud (compared to just 2% currently). And as applications move to the cloud, so does an element of QA/testing. French companies indicate that approximately a third of testing is done in some form of cloud-based testing environment, although they do not expect this to increase between now and 2015, suggesting that any testing that could be moved to the cloud has already been moved.

Connected to cloud adoption is the growing move towards both Testing as a Service (TaaS) and Software as a Service (SaaS). French respondents show some of the strongest movement towards

adopting TaaS, with just 3% of companies saying that they have no plans (compared to 11% overall). Some 45% of French respondents plan to start using TaaS within the next year, and a further 43% plan to start over the next two years.

The main reasons companies in France are looking to use TaaS are to reduce costs (61%), have better resource management (45%), and reduce time-to-market (40%). While there are few perceived challenges to adopting TaaS, almost a quarter of French respondents say that loss of internal know-how is an issue.

On average, French companies say that a quarter of their QA/testing software licenses use the SaaS model ("pay as you go"), and this is expected to rise to 35% by 2015 – somewhat lower than the overall figure of 43%.

A growing area of focus for organizations is the dramatic growth of mobile application and device testing, with the related business and consumer interactions providing a significant QA challenge. New mobile applications and services have to be tested and delivered quickly to match demand. Some 37% of French respondents say they already test mobile applications and devices, but also report significant challenges in doing so.

Top of these challenges, mentioned by 73% of French respondents, is the fact that they don't have the right tools to test mobile applications and devices. Other challenges are non-availability of devices to test (43%) and lack of in-house mobile testing environments (41%).

In summary, French companies continue to look to improve QA levels and to find new ways to reduce costs, enhance their time-to-market, and increase levels of excellence within their testing function. Looking ahead, we expect to see further investment in internal tools/resources and an increase in external outsourced resources – particularly regarding the adoption of cloud-based services and new technology-led challenges such as mobile testing.

**45%** of French respondents plan to start using TaaS within the next year



# Germany

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## Top Trends

- There is a significant increase in move towards development of a Testing Center of Excellence (TCOE).
- A cautious migration of applications towards the cloud has become evident.
- More German organizations are testing mobile applications and devices than in any other country surveyed.

Germany is known as one of the leading nations in industrialized production. One of the best examples of this is the automotive industry, where a high degree of automation goes hand in hand with high flexibility in respect of individual client requirements.

Industrialization has also reached the German IT industry. The continued success of German companies increasingly depends on their ability to quickly introduce IT-based innovations at competitive cost levels. This, in turn, raises the pressure on IT departments to streamline their processes and increase the use of specialized IT service providers. The general careful pace of introducing cloud computing innovations reduces the opportunities for German companies to make further cost reductions in IT. This caution is mostly driven by the uncertainty of data security issues. The expectation is that, as soon as the data security issue is solved, Germany will invest heavily in a quick and high-quality transfer to cloud computing. Cloud testing will then become an important theme, due to the strict German data security laws.

German companies are among the highest investors in testing functions and show a continued desire for excellence in QA/testing in this extremely mature and competitive market. Asked how the testing budget has changed since 2011, some 46% report an increase, and 44% predict further increases by 2015. While this indicates a commitment to ensuring German QA/testing functions are appropriately funded, there is also a note of caution. Some 39% of German respondents predict a decline or severe decline in their testing budget over the next two to three years. Perhaps this

represents a general pessimism about the wider European economic situation and the need to control costs in anticipation of rough economic times.

We asked German respondents which areas of QA will see the greatest increase in spending. Some 56% say existing testing tools, 44% internal professional testing resources, and 40% test environments/infrastructure. When asked to look ahead to 2015, 52% predict that test environments/infrastructure will receive the greatest increase in spending. Interestingly, German companies do not seem to view increased spending on external outsourced resources as being particularly significant.

This year's survey shows that the concept of Testing Centers of Excellence (TCOEs) has risen in take-up across the world, and German respondents have made a clear move in that direction. Some 53% of German companies in 2011 said that they had no plans to use a TCOE. This year that figure has dropped to only 21%. Moreover, some 42% of German respondents indicate that they have started or plan to start developing a functional TCOE internally within the next two years – in synch with the global average of 40%.

A further 31% say they plan to use a third-party company, some 10% more than the global average. German companies expect a TCOE to provide Program Management Office services (51%) and training/knowledge management of testing activities (48%). What do German companies expect to gain from a TCOE? Reduced time-to-market is cited by 48% of respondents, and a further 26% say it will allow for standardized tracking of projects through metrics.

Last year, we reported that German companies seemed more cautious towards cloud computing than other countries. The vast majority of German respondents (67%) in 2011 expected that only a quarter of their applications would be hosted or migrated to the cloud over the next year. Indeed, this appears to have been realistic: one year later, we see that 66% indicate that fewer than 30% of their applications are currently hosted on or migrated to the cloud.

In fact, the reality of cloud adoption is proving a far more cautious move globally than estimated in previous years, and German respondents forecast only a slight increase in the number of applications hosted on or migrated to the cloud between now and 2015. It may be that those applications that can be moved to the cloud have already been moved and that only small increases will occur, or that traditional cloud concerns remain.

That said, the percentage of testing in a cloud-based environment cited by German respondents is among the highest found in our survey. Respondents say that 35% of their testing currently takes place in some form of cloud-based environment (compared to

28% globally) rising to 38% by 2015. As we saw with cloud-hosted applications, it is debatable whether further increases beyond this point are likely.

The use of Software as a Service (SaaS) continues to grow, with German respondents saying that currently 32% of their QA/testing software licenses use the SaaS model, where they only pay for licenses when the software is being used. When asked to look ahead to 2015, respondents believe that some 42% of their QA/testing software will be used in this way.

Similarly, Testing as a Service (TaaS), offered by a third party, is another area where we see an increasing adoption of the service over the next two years. While just 8% of German companies currently use TaaS (compared to 11% overall), some 39% forecast that they will use it over the next year, and a further 47% plan to use TaaS within the next two years. A small minority (5%) of German respondents (compared to 11% overall) say they have no plans to use TaaS at all.

A relatively new and growing area of importance to many organizations is that of mobile application and device testing. More German companies (43%) report that they are currently testing mobile application and devices than in any other country surveyed (31%). Although more German companies are testing mobile applications, they report significant challenges in doing so. Top among those challenges are not having the right tools (67%), devices not readily available (60%), and non-availability of mobile testing experts (40%).

Clearly then, German companies will need to look externally to find the skills and tools required to ensure mobile development is not compromised. Indeed, one of the key factors in choosing an outsourced resource to support their internal mobile testing is that of keeping the development team focused on development.

In summary, our survey of German companies continues to show the maturity and sophistication of the German QA/testing world. Increased investment in the testing budget combined with targeted investment in improving internal skills, testing environment, and infrastructure are only likely to increase this level of sophistication.

However, it is also clear that German companies are reaching out to specialized testing resources to provide expertise that cannot be met internally, or where this is more cost-effective or specialist. The growth of mobility-related services means the pace of innovation in application development will become ever more important. Being able to develop products and services that meet this pace, that have been tested and are fit for purpose, will require greater agility and specialized skill sets.



# The Netherlands

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## Top Trends

- Dutch organizations show a major move to Testing Centers of Excellence (TCOEs) over the last 12 months as they strive to upgrade their QA activities and get applications developed faster.
- Despite pressure to reduce costs, increased investment in QA budgets is expected.
- Dutch organizations remain some of the most mature and developed in their focus on QA/testing.

This year's report confirms that Dutch organizations remain some of the most mature and developed in their focus on QA/testing; the high levels of sophistication, automation, and outsourcing are all indicators of maturity. While there is a continued preference for in-house testing and internal TCOEs, the future for QA/testing in the Netherlands seems to lie in the adoption of new services and technologies that will accelerate the testing processes and measures and prove their value to the business.

A key issue for Dutch respondents is the organization of the testing function. Some 41% have a combination of centralized and decentralized teams, which can lead to inefficiency and communication issues. Only one in 10 Dutch organizations has a centralized testing stream across the organization, and 19% have no separate testing stream at all. A majority of Dutch respondents (52% – slightly higher than the global percentage) have adopted an in-house testing engagement model. Also, more Dutch respondents than the global average approach this by taking on extra staff or a temporary contractor.

It is therefore surprising that only 12% of Dutch organizations rate the quality of their internal testers as being above average, and as having above-average knowledge. This is very low compared to the global average of 23%, itself a low rating. Even the quality of external

testers is under question in the Netherlands, as only 27% (33% globally) rate their quality as above average. This must put strain on the QA function in many firms, as they strive to reduce time-to-market for applications.

In 2011, we reported that 30% of Dutch enterprises had plans to create a standardized and industrialized TCOE, either on their own or through a third-party provider. In 2012, while 35% of Dutch respondents still have no plans to create a TCOE, in line with our global findings, there has been a major move to TCOEs over the last 12 months as organizations strive to upgrade their QA activities and get applications developed faster. Some 5% already have a fully operational internal unit, 13% have implemented a unit internally that is yet to be fully functional, and a further 28% plan to use a third-party company. Finally, one in five respondents plans to develop their own facility within the next two years. As plans developed in previous years become operational, we can see Dutch organizations moving towards a more centralized testing competence – a move we can only see gathering pace over the next few years. It is clear that transforming plans into reality may be significantly more of a challenge than organizations imagine – third-party expertise may be the key to easing that challenge.

Dutch respondents expect the scope of a TCOE to include Program Management Office services, training/knowledge management, and improved control of the testing methodology/processes. The key benefits of adopting this approach include reduced time-to-market, better resource management, and reduced costs.

It is perhaps surprising that only 16% of the total IT budget in Dutch organizations is currently allocated to testing. This is marginally lower than the 18% global figure and potentially explained by the sophistication of testing functions in this market, where new investment in testing is not deemed as necessary as in other markets. Respondents report that 62% of testing budgets is focused on maintenance work (again higher than the global average) and the rest on new transformational work. The fact that some 58% of the testing budget is currently invested in customer-facing applications shows that many organizations in the Netherlands see the growing importance of web, mobile, and cloud developments, and are keen to invest. The direct exposure of the organization to its clients in these kinds of applications means that quality is deemed of highest importance.

Dutch respondents report that the greatest increase in spending is now in existing testing tools and internal professional testing resources. In 2015, they expect the focus to remain on existing testing tools, but predict a shift towards investment in test environment/infrastructure and outsourced resources as organizations strive to speed up time-to-market and reduce costs.

In 2011, the majority of Dutch respondents suggested that the percentage of budgets allocated to testing had mostly remained the same over the previous two years. Now, in 2012, we are seeing some major changes. While only 5% report a significant budget increase, 36% indicate a slight increase, and only 7% show any form of decrease. By 2015, things will have changed again. Some 57% of Dutch respondents expect budgets to have increased, while only 8% forecast a decrease – true evidence of a commitment to testing.

Many Dutch enterprises still show a high level of sophistication in estimating the QA effort for a project. In 2011, we saw that 73% used formal methods; in 2012, this has increased to 84% reporting use of QA metrics across the entire organization, even though teams are not always centralized. Fully 64% of respondents (higher than the 56% global average) automatically collect and share QA metrics using Microsoft Excel or a similar spreadsheet program, and 49% also use a default QA management tool. This, again, is evidence of a keen focus on professionalizing the discipline and realizing a demonstrable ROI.

There is strong evidence for a significant uptake in cloud use in 2012, with 21% of applications hosted in the cloud, according to Dutch respondents – very much in line with the global average. This is expected to rise to 33% by 2015. Dutch organizations also report that, to date, 26% of testing is undertaken in a cloud-based environment (compared with 28% globally). But by 2015, this will have climbed to 41% (58% growth over the period, compared with the global average of 39%).

Testing as a Service (TaaS) offered by a third party is also a key focus for Dutch organizations. One in 10 already uses it, 59% will make the move to TaaS in the next 12 months alone, and only 3% indicate they have no plans to use TaaS. The primary driver is cost reduction, mentioned by 65%. Additional benefits are expected to be better resource management and, to a lesser degree, improved time-to-market. In 2011, our research found that Dutch enterprises were in line with other countries in their approach to deploying Software as a Service (SaaS). In 2012, 34% said they will use the SaaS model (compared to a global average of 31%), growing to 46% by 2015 (compared to a global average of 43%).

In line with the overall average, 31% of respondents currently test mobile applications and devices. The key reported challenges are a lack of the right tools (more of an issue in the Netherlands than elsewhere) and lack of available devices and mobile testing experts.

Currently, mobility testing focuses on efficiency, performance, portability, and functionality – the basic core elements of testing. We predict that this situation will change significantly over the coming few years, with many applications from the outset being designed around mobile devices.



# The Nordic Region

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## Top Trends

- Nordic respondents predict significant investment in new testing tools and internal professional testing resources.
- A quarter of Nordic respondents, more than in any other region, say they intend to use a third party with Testing Center of Excellence (TCOE) capability.
- A high number of Nordic organizations already test mobile applications and devices, but face challenges in doing so.

Although there are signs that the worst of the recession is over in much of the Nordic region (defined in this survey as Denmark, Finland, Norway, and Sweden), the global recovery has an impact on regional economies, and makes a return to economic growth unlikely to be fast or robust. Companies are still mainly driven by cost reduction as the number one item on the agenda.

Today, in the Nordic region, QA is well established in many major organizations, with a formalized testing procedure and supporting budgets, and is furthermore recognized as a profession with dedicated resources. For smaller organizations, however, the testing focus is much more erratic.

Looking at this year's Nordic survey data, organizations report that 18% of their overall IT budget (in line with the global average) is invested in testing. This ranges from 21% in Sweden to only 14% in Norway. Some 42% of the overall regional testing budget is invested in new transformational work, as opposed to maintenance work, so innovation is key to organizational testing behavior.

Nordic organizations report that the greatest increase in testing spend is in the areas of existing testing tools and external outsourced resources. However, by 2015, the focus will shift, with significant increased spending, relative to 2012, directed at new testing tools and internal professional testing resources.

In 2011, 33% of Nordic respondents indicated that budgets for testing and QA activities had stayed the same over the previous two years, and 31% indicated that it increased slightly over the same period. In 2012, 49% of the respondents indicate that budgets have stayed the same, while 28% say they have increased slightly.

Looking at the testing function, it appears that its overall management may need to change. In the Nordics, 44% of organizations (48% in Sweden) use a combination of centralized/decentralized teams, which can lead to difficulties in overall control and management. Only 11% of organizations in the region deploy centralized teams as a single stream across the business, but this is higher than the global average.

A key issue faced in the industry is whether testers – both internal and external to the business – are meeting expectations. Some 63% of Nordic respondents (80% in Norway) say that the quality of their testers is at best average. This should be an area for change over the coming few years. With the need for testing to be faster and more sophisticated, it is our opinion that “average” will not do.

Only 28% of all organizations across the region report that their internal testing resource quality is better than average. While 44% of respondents report that the quality of external testing resources are better than average (well above the global percentage), this still leaves room for improvement.

One approach to lifting the overall quality of the testing function is to look at developing a Testing Center of Excellence (TCOE). In the Nordics, 40% of all organizations (higher at 65% in Denmark), say they have no plans to implement a TCOE in the foreseeable future. Around a quarter of organizations plan to develop a TCOE within the next two years, and a further third plan to use a third party. Almost one in 10 organizations (lower than the global average) has embarked in the last two years on a TCOE that has yet to be completed.

The core elements that Nordic respondents would want to be included in the scope of a TCOE include training/knowledge management of the testing activities, Program Management Office services, and functional testing. The key benefits that Nordic organizations seek in a TCOE include, in order of importance, reduced time-to-market, reduced cost, and better quality.

Nordic respondents also recorded a significant move to Testing as a Service (TaaS). Around one in 10 organizations in the region has implemented TaaS to date (in line with the global average), with Norway 17%, Denmark 16%, and Sweden 12% leading the way, and Finland somewhat lower at 3%. However, looking ahead, half the Nordic organizations surveyed (60% in Sweden) are looking to implement TaaS in the next 12 months, and a further 19% in the next two years.

For Nordic respondents, the move to TaaS is being driven by a need to reduce costs, reduce time-to-market, and also improve resource management. Whilst some organizations may not be willing to embrace this approach, this still represents a strong signal that organizations see the benefit of moving to TaaS.

In 2012, respondents say that 22% of testing (lower than the international average of 28%) is cloud based but that this will rise to 37% – in line with the international average – by 2015. To date, Nordic organizations report that they have migrated 18% of their applications to the cloud, less than the 22% overall seen in the survey this year.

The technology world is changing, and mobility is one of the biggest changes we are likely to see in the next few years. In the Nordic region – itself a leader in mobile technology – 38% of organizations (higher than the 31% global average) currently test mobile applications and devices, with those in Finland and Sweden ahead in this activity. The key reported challenges for mobile testing are a lack of the right tools for testing, and availability of the devices.

In the Nordic region, in light of the economic crisis, there is a clear move to continue to reduce costs, as well as reduce time-to-market for applications and developments. The increased use of cloud-based technologies aids cost-cutting and also time-to-market, but the issues around mobility testing will come to the forefront in the short term, because robust mobile applications are essential to a successful organization. This adds cost and complexity to an already complex world.

The evidence is that the testing discipline in the Nordic region will continue to develop, but in order to meet future market demands, IT and the business must broaden their approach and realize that testing and QA work effectively at both strategic and operational levels. This will be important to achieving core goals, such as lower cost, delivery precision, and quality. A greater focus on testing can be an important route to improved efficiency and lower-cost productivity for many Nordic organizations.



# North America

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## Top Trends

- 58% of North American respondents plan to use Testing-as-a-Service (TaaS) in the next 12 months.
- The cloud is seen as a way to optimize cost management, improve flexibility, and help align IT with the needs of the business.
- 44% of North American organizations say their QA/testing budget has increased this year, with 50% saying it will increase further before 2015.

North America combines the large, technologically powerful market-oriented economies of the US and Canada. With the private sector tasked with underpinning market growth, organizations are targeting increased revenue by introducing products faster and engaging customers through new content-rich channels, as well as launching new programs to increase customer trust – highly important in a very competitive marketplace.

As the North American economy returns to growth, organizations are focusing their IT investments more than ever on innovation. Business-as-usual IT investments are declining as legacy-based systems are overhauled and transformational projects are implemented to drive faster time-to-market and exploit new channels. Other factors, such as regulatory changes in the Financial Services and Healthcare sectors, are also bringing about an enhanced IT focus. With all these changes, the role of QA within organizations is more important than ever, in order to maintain brand image and customer loyalty, drive faster time-to-market, and ensure a strong return on investment (ROI).

This year's analysis highlights that only 20% of North American organizations rate their internal testing resources as above average in terms of quality. Even external testers are said to need additional skills – only 26% of organizations rate their external testers' quality as above average. "Adequacy" will not drive change, nor will it drive better quality.

A key question is how to structure the testing function. In North America, 35% of organizations report that the testing function is highly decentralized, and a further 41% operate combined centralized/decentralized teams. Moreover, 64% of companies report that internal testing functions are performed by business

analysts or development teams. None of this engenders a common testing approach or good communication, and can lead to suboptimized output.

In 2011, we reported an increase in standardized Testing Centers of Excellence (TCOEs) to optimize QA/testing capabilities, with almost 50% of organizations using contractors to outsource their testing function. However, in the last 12 months, there has been a TCOE sea change. While only 35% of North American organizations (in line with the global average) have no plans to implement a TCOE in the near future, 30% plan to implement an internally managed TCOE in the next two years, and a further 19% plan to use third-party TCOE capability.

One in 10 organizations is still completing the implementation of their TCOE started in 2011, but only a minority have actually made the full transition. Some 50% of respondents require a TCOE to include Program Management Office services, 42% functional testing, and 41% training/knowledge management. The key benefits organizations expect from a TCOE include reduction in time-to-market, better resource management, improved quality, and, to a lesser degree, cost reductions. It is no surprise that cost reduction is no longer one of the top three reasons for moving to a TCOE, as North America has led the rest of the world in leveraging offshore testing resources.

The commitment to testing is demonstrated by the allocation of North American IT budgets to testing. At 18%, it is on a par with the global average, but more encouraging is that 40% of this budget is allocated to innovation/new transformational projects, and 63% (higher than the 59% global average) to customer-facing projects. The drive for improved customer experience is clear.

Some 44% of organizations also report that the proportion of the IT budget allocated to testing has increased at least slightly, and half say that by 2015 the proportion allocated to testing will have increased. Only 6% of organizations report that the testing budget is static or declining.

North American respondents report the greatest increase in investment in existing testing tools (60%) and outsourced resources, confirming the 2011 trend in which more outsourced activity was planned. These focus areas for investment are consistent through 2015.

It is highly encouraging that 89% of respondents agree that they are consistently measuring QA metrics across the entire organization, but they also list metrics as one of their greatest challenges. Companies have standardized their QA metrics reporting; however, they still struggle with how to clearly communicate to the business the status of testing efforts. Only 20% of North American organizations use industry-standard estimation methods, and 40% use an in-house developed estimation. Not surprisingly, 64% of organizations automatically collect and share QA metrics via Excel, while 43% also use default QA management tools.

Test automation continues to be a key area to improve time-to-market and meet deadlines. Across the board, NA respondents claim to have 36% of their test cases automated, and believe that 42% automation is a realistic goal. Measuring automation percentages can be misleading and does not tell the true value of automation. In our view, determining ROI is the only way to really understand its value.

Much has been written about the cloud, and, certainly, testing is leading the way in exploiting its value. North American respondents report that 28% of testing is currently cloud based. The trend of exploiting the cloud to use or establish testing environments, and host or use pay-per-use testing tools, fits with the call for on-demand testing resources. Organizations expect to see this trend continue, and estimate that 40% of testing will be cloud based by 2015.

North American respondents also report that 23% of their applications have been hosted in the cloud, with a further rise to 34% expected by 2015. This commitment to the cloud is also reflected in the increased use of the Software as a Service (SaaS) model. In 2012, 33% of software licenses are via SaaS and this is expected to rise to 46% by 2015, higher than the global average. It is clear that organizations will look to use the cloud for better cost management, increased flexibility, and IT alignment with the needs of the business.

Testing as a Service (TaaS) from a third-party provider is also set to make a major impact on the market in the coming 24 months, with 58% of respondents planning to sign up for a bundled QA service in the next 12 months. The desire to reduce costs, improve resource management, and reduce time-to-market is the key driver.

The drive to rapidly develop high quality mobile applications is impacting all organizations, yet we found that only 25% of North American respondents test any mobile applications or devices. The key reasons cited are lack of the right tools, readily available devices, and appropriate testing methods/processes. An interesting observation is that users expect robust functionality, but that our respondents' major concern is stability and performance of the application, regardless of location.

In our opinion, outsourcing mobile testing should be considered by North American organizations, as they need to focus on increasing the quality, scale, and professionalism of mobile application and device testing, or consumer satisfaction will suffer.

Much has certainly changed in the QA world in North America since our last survey, in particular optimizing the advantages of TaaS, SaaS, cloud and mobile applications, and the trend for TCOEs. The need to bring quality applications faster to market was never more evident in this highly competitive and demanding economy. Flexibility, responsiveness, reduced cost, and time-to-market are core issues, and those organizations that can harness the balance between internal management and external sourced resources are sure to be in the strongest positions when the economy moves back into real growth.



# United Kingdom

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**BY BRIAN SHEA**

CEO  
Sogeti UK

**SUNIL MUNSIF**

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## Top Trends

- 19% of UK organizations currently test mobile applications or devices.
- More than 83% of organizations intend to use Testing as a Service (TaaS) offered by a third party.
- Mobile application and device testing is a growing challenge.

In 2011, we reported that fundamental changes were taking place in the UK, but we could not have predicted the double-dip recession that hit the UK over the last 12 months. Inflationary pressures, austerity measures, unemployment, and the Euro crisis that threatens to engulf the UK are all contributing to an unsettled market.

But even in this economic uncertainty, UK corporations are conserving cash, looking at emerging markets for growth, and driving out costs. So investment by the private sector in IT transformation projects, and in technology in general, continues as firms seek to improve productivity, do more with less, and embrace the mobile revolution.

IT services companies, including those in the Quality Assurance (QA) sector, find that customers are demanding more of their providers: experienced project delivery but lower day rates, acceptance of more risk, and in-built transformation – factors that are supported by our UK findings.

The UK QA/testing market is, by all definitions, mature – as evidenced by the fact that only 45% of organizations use an in-house engagement model for testers, compared with 51% globally. Some 18% of UK organizations (compared with 13% globally) use an external managed service where the external vendor owns the testing delivery.

It is surprising that only one in five UK organizations rates the quality of their internal testing resources as above average, indicating, perhaps, that the outsourced route could enable firms to uplift their capabilities. Indeed, the quality of external testers is seen to be superior, with 35% saying that the quality of the testers is above average.

Testing function structures vary greatly in the UK. Some 45% of respondents use a combination of centralized/decentralized teams, thereby running the risk of some loss of overall integration

and management. A quarter of organizations have no separate testing streams, and 21% report highly decentralized teams across different business units.

In 2011, we saw the concept of the Testing Center of Excellence (TCOE) come of age, with 56% of respondents indicating that a TCOE would be developed in the next two years, and 37% reporting they were already building and managing this internally. As a further sign of UK market maturity in 2012, almost one in 10 TCOEs is fully operational, 13% of organizations have started to move to a TCOE in the last two years, 25% plan to develop internally managed TCOEs in the next two years, while 38% of organizations still have no plans for a TCOE. By 2015, 62% of organizations will have moved to a TCOE, including Program Management Office services, training/knowledge management, performance, and functional testing. The greatest benefits that UK respondents seek from this approach include reduced time-to-market and better resource management.

UK respondents report that 18% of the total IT budget is allocated to testing, in line with the rest of the countries. Some may think this is low, but IT budgets have been increasing year on year, even in economically troubled times, so the real investment in testing is also growing. It is encouraging that 42% of the budget is for new transformational work rather than maintenance, and equally that 58% is invested in testing customer-facing applications.

UK organizations also report that the two main QA areas of greatest increase in spending are internal professional testing resources and existing testing tools. In 2015, the focus is set to move to external outsourced resources and the test environment/infrastructure.

The commitment to the testing function is also set to increase, as 46% of organizations report that the percentage of the IT budget allocated to the testing function has increased in the last year and fully 57% report that by 2015 the budget will have increased.

UK market maturity is further demonstrated in the quantification of quality. As in 2011, three-quarters of 2012 respondents indicate that they consistently measure QA metrics across the entire company. But there is room for improvement. Some 16% of test data is spreadsheet based and manually generated, and only 8% of respondents use purchased automation tools.

In 2011, we saw the move towards Software as a Service (SaaS) models and, more generally, a focus on cloud-based activities. This year sees a greater commitment to use the cloud – but only to a certain level. In the UK, on average, respondents say 25% of testing is currently in a cloud-based environment – below the overall study average of 28%. But by 2015, the level will have risen to 40%, perhaps a natural cap, because it seems that organizations that have not made the move to cloud-based testing by 2015 will be unlikely to move at all.

Testing as a Service (TaaS) offered by a third party looks set for major growth in the next two years. Currently, only one in 10 UK organizations uses TaaS, but 45% will move down that road in the next 12 months and a further 38% in 24 months. Only 5% of UK organizations have no TaaS plans at all. The drivers for this are reported to be to reduce cost and time-to-market, and improved resource management. Challenges with TaaS, mentioned by only a few organizations, center on loss of control of the total testing spend, scalability, and security, but none was mentioned by more than 25% of respondents.

UK organizations estimate that 22% of applications are hosted in the cloud now (in line with the global percentage) and that by 2015 this is expected to rise to 32%. This year highlights a greater use of SaaS compared to last year, when SaaS models were basically seen as pay-as-you-use software and there was no discernible difference between the number of organizations wanting to move further into SaaS and into the cloud. This year, fully 30% of QA/testing software licenses use the SaaS model, and respondents say this will grow to 44% by 2015.

It is surprising that only 19% of UK organizations (compared with 31% globally) say they currently test any mobile applications or devices. The biggest issues faced are said to be lack of the right tools and availability of devices, and current testing is focused on efficiency/performance, portability, and, to a lesser degree, functionality.

If UK organizations were to outsource mobile testing, their reasons would be suppliers' capacity to test applications on a large range of devices, and consequent ability to refocus their internal teams on development.

Looking ahead, there will be increased focus on testing quality especially because mobility will change the way IT functions within many organizations, and, while security is always a concern, mobility is driving consumer experience, functionality, and performance.

As in 2011, viewing the findings together, we can infer that UK organizations clearly understand the benefit of investing in quality and using their resources to the full, but, at the same time, recognize the need to reduce time-to-market and focus on customer-facing activities. The market has certainly moved beyond a simple cost-reduction focus as part of its ongoing maturity, and the increasing levels of investment and the linking of testing excellence to success in the business serve to underline this conclusion.

# ABOUT THE STUDY

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The 2012-2013 *World Quality Report* is based on a total of 1,553 detailed telephone interviews undertaken during April and May 2012, with senior executives from a range of IT and business-related functions in medium and large private companies, government and public sector organizations, across 25 countries. This data was augmented by in-depth client interviews, and then analysis and commentary carried out by our own specialists.



## INTERVIEWS BY COUNTRY AND SIZE OF COMPANY

FIGURE 19

COUNTRY	NUMBER OF RESPONDENTS	SIZE OF COMPANY		
		10,000+	5,000-9,999	1,000-4,999
USA	296	119	99	78
CANADA	25	10	9	6
BRAZIL	87	36	29	22
FRANCE	150	60	53	37
GERMANY	135	50	48	37
NETHERLANDS	126	50	44	32
BELGIUM AND LUXEMBOURG	25	10	8	7
SWITZERLAND	27	10	10	7
UK	125	49	44	32
IRELAND	25	10	9	6
SWEDEN	85	33	31	21
NORWAY	30	13	9	8
DENMARK	31	12	9	10
FINLAND	30	12	11	7
CZECH REPUBLIC	25	7	6	12
POLAND	22	7	9	6
HUNGARY	20	8	7	5
ITALY	20	8	7	5
SPAIN	20	8	7	5
PORTUGAL	20	8	7	5
AUSTRALIA	90	32	31	27
NEW ZEALAND	11	7	4	0
CHINA	103	40	35	28
HONG KONG	12	5	4	3
SINGAPORE	13	6	4	3
<b>TOTAL</b>	<b>1553</b>	<b>610</b>	<b>534</b>	<b>409</b>

Base: 1553 Respondents

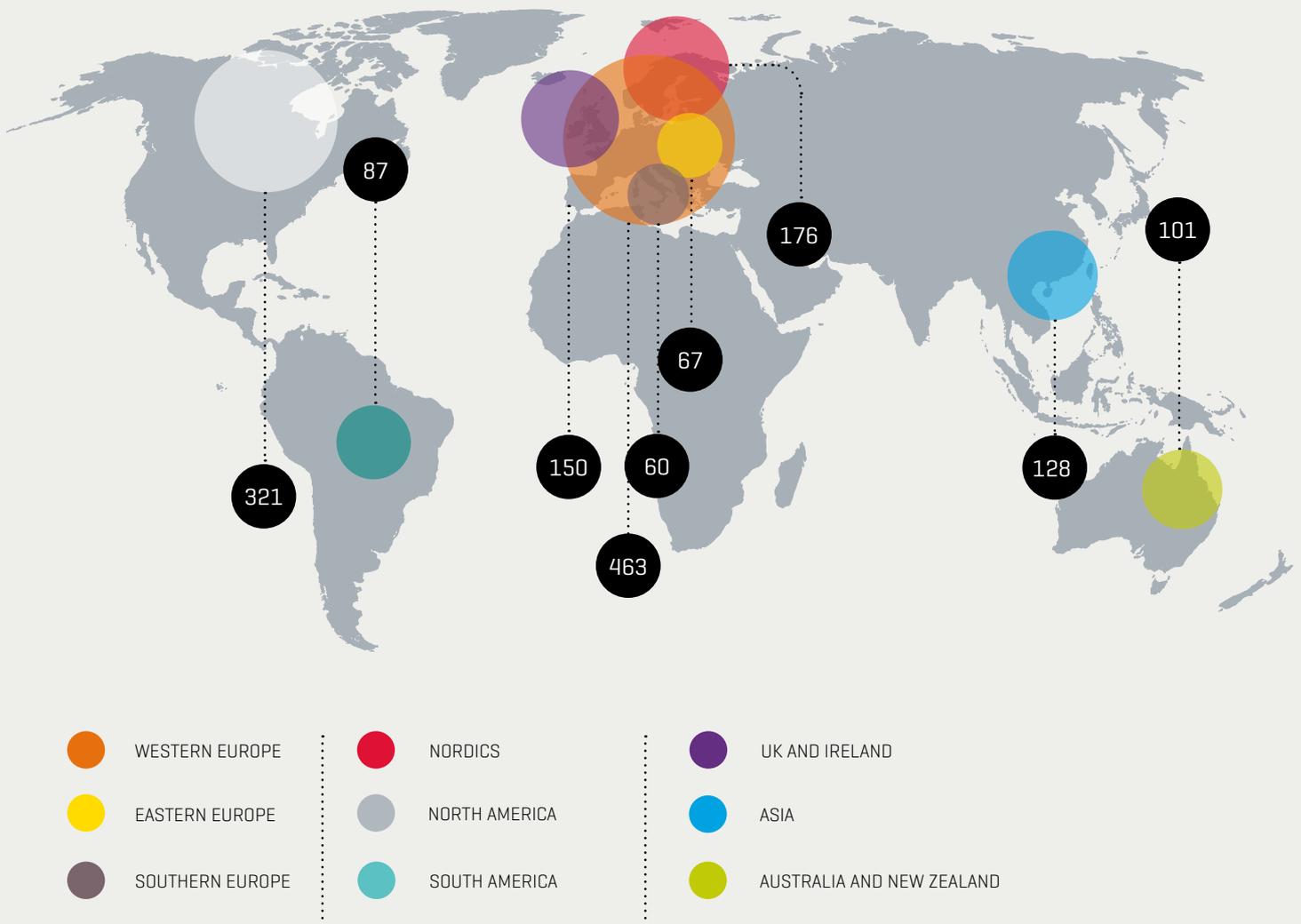
## SURVEY SAMPLE

This year we focused on companies and public sector organizations with more than 1,000 employees, and the detailed breakdown of the number of interviews by size is shown in the table above. It should be noted that a conscious effort was made to ensure that a representative distribution of interviews for each size of company was covered in each country.

A total of 25 countries participated in the survey. The total number of interviews aggregated by region is shown below.

INTERVIEWS BY REGION

FIGURE 20

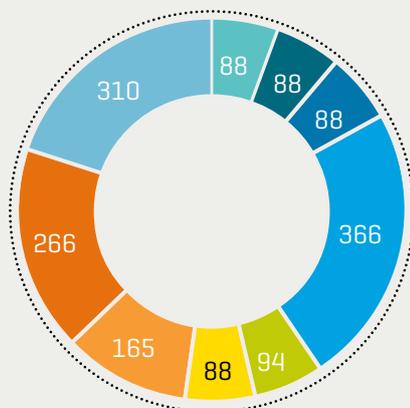


Base: 1553 Respondents

INTERVIEWS BY SECTOR

FIGURE 21

- CONSUMER PRODUCTS, RETAIL, AND DISTRIBUTION
- TRANSPORTATION
- ENERGY AND UTILITIES
- FINANCIAL SERVICES
- MANUFACTURING
- HIGH TECH
- HEALTH AND LIFE SERVICES
- TELECOMS, MEDIA, AND ENTERTAINMENT
- PUBLIC SECTOR



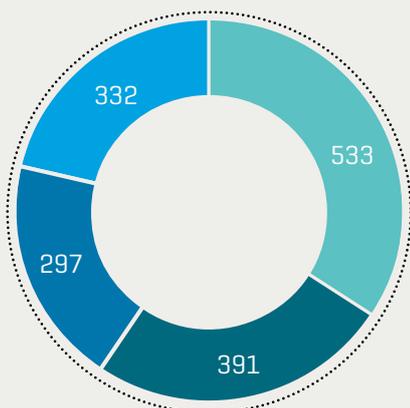
**1553**  
TOTAL RESPONDENTS

Base: 1553 Respondents

INTERVIEWS BY JOB TITLE

FIGURE 22

- CIO'S
- IT DIRECTORS
- VP APPLICATIONS
- QA/TESTING MANAGERS



**1553**  
TOTAL RESPONDENTS

Base: 1553 Respondents

In addition, responses were required from core vertical sectors with the number of interviews conducted shown in the graph on the right, which provides great insight into the test and QA issues within each industry vertical. This also allows us to compare and contrast the views sector by sector.

Finally, additional controls were used to ensure that a representative range of opinions and views was obtained during the survey.

**QUESTIONNAIRE AND METHODOLOGY**

The survey questionnaire was devised by our QA and testing experts in the three sponsoring organizations involved in commissioning the research: Capgemini, Sogeti, and HP, in consultation with Coleman-Parkes Research. All research was executed using a telephone-based approach, rather than an online questionnaire as used last year. The move to telephone-based research was largely driven by the change in the size of companies being covered.

The 40-question survey covered a range of QA and testing subjects enriched by the collection of qualitative data in additional in-depth interviews, which are included for the first time as quotations in the report.

*During the telephone interviews, survey questions were posed based on their relevancy to the respondent's job title. For this reason, the base number of respondents for each survey question shown in the graphs is not always the full 1,553 sample size.*

# ABOUT CAPGEMINI AND SOGETI

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With more than 120,000 people in 40 countries, Capgemini is one of the world's foremost providers of consulting, technology, and outsourcing services. The Group reported 2011 global revenues of EUR 9.7 billion. Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

Sogeti is a wholly-owned subsidiary of Cap Gemini S.A., providing local professional services. Sogeti brings together more than 20 000 professionals in 15 countries and is present in over 200 locations in Europe, the US and India.

Together Capgemini and Sogeti have developed innovative, business-driven quality assurance (QA) and testing services, combining best-in-breed testing methodologies (TMap® and TPI®) and the global delivery model, Rightshore®, to help organizations achieve their testing and QA goals. The Capgemini Group has created one of the largest dedicated testing practices in the world, with over 9,500 test professionals and a further 14,500 application specialists, notably through a common center of excellence with testing specialists developed in India.

Learn more about us at  
[www.capgemini.com/testing](http://www.capgemini.com/testing) or  
[www.sogeti.com/testing](http://www.sogeti.com/testing)

# ABOUT HP

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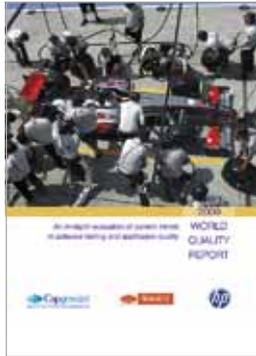
At HP, we don't just believe in the power of technology. We believe in the power of people when technology works for them. To help you create. To make the digital tangible. To harness the power of human information. At HP, we work to make what you do matter even more.

Our Business Technology Optimization (BTO) products, along with our new and complete approach to Application Lifecycle Management (ALM), help our customers to achieve better business outcomes.

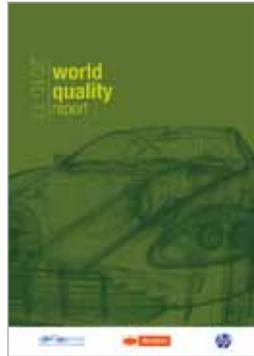
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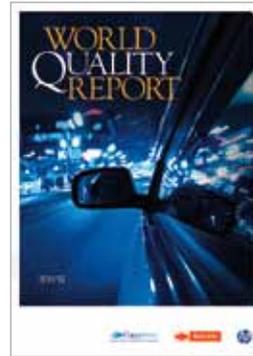
## PREVIOUS EDITIONS



**First Edition**  
*2009 World Quality Report*



**Second Edition**  
*2010-11 World Quality Report*



**Third Edition**  
*2011-12 World Quality Report*

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## THANK YOU

We would like to thank all the respondents who provided in-market experience, expert opinion, and input into this year's survey. In accordance with the UK's Market Research Society Code of Conduct (under which this survey was carried out), all respondents are anonymous, but we appreciate the time that each interviewee provided on the call with our team.

Our thanks also go to the many subject matter experts within the Capgemini, Sogeti, and HP teams, who provide invaluable local insight and input into the development of the sector and region sections of the report.

We would like to thank the team of collaborators who helped create this year's report.

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