Digital Testing in Europe:
Strategies, Challenges & Measuring Success

© PAC 2015
Today’s business world is increasingly high-velocity and software-driven. The proliferation of digital technologies - social, mobile, analytics, cloud, the Internet of Things - is pushing every company to rethink and reinvent its approach to testing. Digital testing teams globally are under intense pressure to quickly respond to this changing marketplace with high quality applications that seamlessly serve their end customers and protect their companies’ brand. No longer a supporting capability, testing is now a driver of strategy and competitive differentiation.

Partnering with PAC, we bring you this study to help you navigate through these challenges and equip your digital testing strategies to meet the needs of your business. The study prompts every business leader to ask two important questions: Does our testing approach prepare us for the digital disruption to our business? Does our testing strategy address exponential growth in volume, velocity and complexity in IT ecosystem while managing security vulnerabilities in this highly interconnected world? We hope you can use the study findings to provoke discussions within your company to define the right digital testing resourcing, tooling and investment strategies.
To succeed in a high-velocity, software-driven world, Accenture helps companies transform testing into a continuous and efficient end-to-end quality engineering function. Accenture offers the entire breadth and depth of Testing services across a broad array of applications, digital technologies and industries delivered under flexible business arrangements to help clients shape their digital future and lead their industry while delivering an exceptional customer experience. Typical results include two-fold increase in productivity with as much as 95 percent automation penetration, improved application quality with up to 98 percent reduction in critical defects and more than 50 percent accelerated speed to market all while being able to cut test operation costs in half.

Accenture’s unique strengths that power our clients’ high performance include:

- **Industry specialization** with more than 80 percent testing professionals specialized in an industry coupled with an extensive experience of serving over 1,000 testing clients across more than 40 industries
- **Pioneering cognitive automation** working with Accenture Technology Labs, major research institutes and startups
- **Digital leadership** with more than 10 years’ experience delivering innovative solutions for the digital business and shaping the testing specifications for the industrial Internet of Things
- **Cloud innovations** built on a $400 million investment in the industry leading Accenture Cloud Platform
• **Powerful alliance** ecosystem of more than 150 leading and emerging technology providers including over 30 testing specific alliances

• **Unparalleled global delivery** with more than 31,000 testing professionals across more than 30 delivery centers in 17 countries serving clients in over 120 countries

About Accenture

Accenture is a global management consulting, technology services and outsourcing company, with more than 358,000 people serving clients in more than 120 countries. Combining unparalleled experience, comprehensive capabilities across all industries and business functions, and extensive research on the world’s most successful companies, Accenture collaborates with clients to help them become high-performance businesses and governments. The company generated net revenues of US$31.0 billion for the fiscal year ended Aug. 31, 2015. Its home page is [www.accenture.com](http://www.accenture.com).
1. Key Findings
Key Findings

**Digital having a major impact on the testing/QA function.** More than three quarters of European businesses agree that the expansion of their digital presence will be their number one IT priority over the next two years. Testing budget is increasingly being shifted towards supporting new projects, while the biggest challenges that stakeholders perceive around digital testing relate to supporting the integration of digital into legacy apps and taking a consistent approach across multiple platforms of engagement.

**European businesses are racing to get their digital strategies in place.** Only 18% of European organizations claim to have fully implemented their digital testing strategies, while a further 26% claim to have formulated them but have not yet rolled them out. But the biggest group is the 35% of business which plan to put their strategies together in the next 12 months, leaving a rump of 21% that have yet to make a move – with a large proportion of the laggards based in Southern Europe.

**Quality is king.** One of the most interesting findings of the study is that the need to improve quality remains the number one driver for both digital testing projects as well as the testing of existing applications. There is a greater need for speed in supporting the former, with “accelerating test cycles” cited as a bigger priority, but quality and a push for greater efficiency in the way that testing is performed remain the top two goals. There is an increasing focus on end-to-end business process quality.

**Diverse digital tactics.** There is no single magic formula that European businesses are following to tackle digital testing. More than 60% of businesses use the same team to test both digital projects and existing applications, while the majority of companies use an array of tools (in-house, packaged, open source) and approaches (virtualization, in-production testing) as part of their digital testing strategies. Automation coverage looks set to expand rapidly in the next 12 months.
The European Picture

UK
- More than one quarter of businesses have already fully implemented their digital testing strategy.
- 74% expect their testing strategy to become more business process centric.
- Only 34% test digital apps in production, while 69% use virtualization.

Benelux
- More than one third automate testing for 30%-50% of business processes.
- 67% plan to accelerate investment in Performance Engineering in 2016.

France
- 49% will have digital testing strategy in place in next 12 months.
- Just 23% currently monitor end user experience and get user feedback.
- Less than 25% have separate teams for testing digital and existing applications.

Spain
- 80% plan to increase investment in Agile tools & methodologies in 2016.
- 40% plan to launch digital testing strategy in next 12 months.

Germany
- 65% test digital apps in production, and 74% use real device testing.
- 49% plan to increase investment in DevOps in 2016.
- 23% plan to adopt crowdsourcing in next two years.

Switzerland
- 40% of businesses will roll out their digital testing strategy in the next 12 months.
- 75% cite security testing as a priority area for testing new development projects.

Nordics
- 48% use different resource teams for testing digital and existing apps.
- 88% monitor end user experience and get user feedback.
- One third plan to adopt crowdsourcing testing solutions in the next 12 months.

Italy
- 47% expect their testing strategy to become more applications centric.
- 40% claim that their internal testing organizations are fully centralized.
2. Background & Methodology
Introduction

The testing and quality assurance function faces a massive challenge as it tackles two important but divergent demands of the business.

Firstly, it is being required to help with the overall efforts of the IT organization in reducing the “lights on” operating costs by running testing more efficiently. This means a greater centralization of testing resources, optimization of low-cost delivery teams and the use of standard tools and methodologies to reduce the amount of testing effort that is required.

The other challenge is to ensure that the testing and QA function is able to support the digital agenda of the business, where time-to-market outranks cost as the top priority. The need to modernize and innovate areas such as mobile applications, self-service websites, social media analytics and multi-channel e-commerce platforms is hugely important in order to remain competitive and meet the rapidly changing demands of the customer.

At the same time, many core elements of the digital strategy are being led by business lines such as sales and marketing, who are often circumventing the CIO and undertaking their own development projects – often leveraging cloud-based tools and platforms.

So how can the testing function ensure that they get their arms around both of these dynamics?

Against this background PAC conducted a survey among 200 senior testing and IT executives in European businesses (France, Germany, Italy, the Netherlands, the Nordic region, Spain and the UK) each with more than 500 employees. The study explores the following questions:

• What are the major challenges and pressure points facing testing organizations in Europe?
• How is the digital agenda impacting the structure of internal testing organizations?
• How are businesses ensuring that they test digital applications to meet real-world requirements?
• Is the testing function working more closely with the business and how is this being achieved?
• What impact are DevOps and Continuous Development having on the European testing market?
• What are the investment priorities of testing organizations for the next two years in support of their digital strategies?
• Which tools and resourcing models are testing organizations leveraging to tackle digital?
Survey of Testing CxOs in Europe

200 survey respondents in Western Europe

54% CIO/ITD respondents
30% Head of Testing respondents

All respondents had over 500 employees

Survey conducted in July/August 2015
Many European testing leaders have spent the last decade focused on improving the efficiency of the testing function, through centralization, offshoring and standardization initiatives. But it is clear that budget constraints remain a key concern, with 89% of study participants citing it as a primary or secondary challenge facing their testing organization. The importance of the digital agenda was highlighted by the level of participants citing the need to work closer with business leadership (86%) and the need to accelerate time to market (77%) as significant challenges. It is interesting to see that the ability to demonstrate the value of testing to the business ranked bottom in the list of challenges, which underlines how the issue of software quality has become a business issue as organizations become increasingly dependent on their software platforms.
Where is the Risk?

Understanding the areas of risk that businesses perceive to have the greatest potential impact on their business is a good indicator of the priorities that are placed on the testing function. The study tested four different areas of risk – competition; customer; revenue; and brand, and all four scored relatively evenly. The picture varied across different industry sectors. Participants based in the heavily regulated financial services sector scored highly on all four areas of risk, with 24% each citing ‘competitive’ and ‘revenue’ as areas of highest risk. In contrast, just 5% of public sector organizations see competitive risk as an area of high risk, but they are concerned about revenue (20%), which is understandable in the context of budget efficiency drives across European government organizations.

### Q. What are the areas of highest risk for your organization in 2015?

<table>
<thead>
<tr>
<th>Area</th>
<th>Highest Risk</th>
<th>High Risk</th>
<th>Medium Risk</th>
<th>Low Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive</td>
<td>31%</td>
<td>30%</td>
<td>22%</td>
<td>17%</td>
</tr>
<tr>
<td>Customer</td>
<td>28%</td>
<td>42%</td>
<td>16%</td>
<td>14%</td>
</tr>
<tr>
<td>Revenue</td>
<td>32%</td>
<td>36%</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>Brand</td>
<td>25%</td>
<td>36%</td>
<td>10%</td>
<td>29%</td>
</tr>
</tbody>
</table>
3. Digital Testing Strategies
Q. Do you agree that the expansion of its digital presence is your company’s number one IT priority for the next two years?

I Do Not Agree

I Somewhat Disagree

I Somewhat Agree

I Wholeheartedly Agree

6%
16%
48%
30%

‘Digital’ has become the dominant term in the IT industry in 2015, but what is the real impact on European businesses? The majority (78%) of participants in the study agree that the expansion of their organization’s digital presence will be the top IT priority over the next two years. This is particularly the case in the Nordics and Benelux regions, where 88% of participants agree that digital is their top IT challenge. But it is not just something that businesses in mature markets are wrestling with, as 80% of participants in Spain and Italy also believe digital will dominate their mid-term IT strategies. This highlights the importance of organizations ensuring that the testing function is fully aligned to supporting the digital agenda.
PAC defines ‘digital’ technology in the context of this study as encompassing the new wave of developments in what is commonly referred to as the ‘SMAC’ stack: social media; mobile; analytics; and cloud. And senior testing executives at European businesses believe that all four areas will have a significant impact on their business and revenue growth in the next three years, with at least 55% expecting a ‘medium’ or ‘high’ impact across all four areas. Businesses in the financial services sector are bracing themselves for the biggest changes as a result of digital. Some 89% of banks and insurance providers expect a ‘high’ or ‘medium’ impact from social technology, with 87% giving a comparable rating for mobile and 71% for analytics, where the use of data analytics tools is extending from risk calculation into understanding customer behaviour. In contrast, 65% of public sector agencies expect a significant impact from social and just 55% from mobile.
European businesses clearly expect digital to have a significant impact on their business, but how far have they got in terms of developing a strategy for testing these technologies? It is clearly a work in progress, with just 18% having fully implemented their strategy and more than one half yet to put one in place – although 35% are aiming to draw up a strategy in the next 12 months. Businesses in the UK and Germany lead the way. In the former, 26% claim to have fully implemented their digital testing strategies, with a further 32% having one in place with implementation planned in the next 12 months. A very polarized picture emerges in the Benelux region where 28% have a strategy in place, while the same level have yet to start planning. The laggards include Italy, where 53% have no strategy in place or in the pipeline.
What challenges are European businesses looking to tackle with their digital testing strategies? The biggest obstacle is perceived to be taking a consistent approach to testing across multiple channels of engagement, which was cited as a primary challenge by almost half of all participants. This is a particularly strong challenge in the financial services sector, where 63% of participants cite it as a major challenge, reflecting the impact they believe mobile and social channels are having on their business. The second biggest issue is that of integrating digital into legacy systems, which was flagged as a ‘primary’ challenge by 39% of participants. As we shall see, many European organizations run separate teams and leverage different tools to support digital and legacy testing, which makes bridging the gap a real issue, and one that needs solutions not just in terms of technology platforms, but also in culture and leadership. It was also interesting to see the issue of recruitment raised as a concern (35% named it a primary challenge), which is reflected in the strong growth being enjoyed by many testing services and staffing agencies in 2015 as they help fill their clients’ skills gaps around the SMAC stack.
Functional and security testing top the priority lists for European businesses in terms of their digital testing strategies. More than 90% of participants in the study cited both areas as either major or secondary priorities, with 65% stating that functional testing is a major priority. It is not surprising to see security testing near the top of the list, with 60% citing it as a major priority. Many of Europe’s leading testing services firms name security testing as a big growth area in 2015, and there has been a clear shift in focus away from network perimeter testing to the application layer, which is where the threat of attacks and breaches looms largest. One of the interesting findings is that 45% of participants identify user experience testing as a major priority, but as we shall see later in the study, there are some huge gaps in the way that businesses currently monitor user experience and relay the results back to the business. It is also intriguing to see load testing listed as a major priority by just 37% of participants. This is largely due to the array of mature and scalable load testing automation tools and platforms currently available on the market, which makes this less of a challenge than it used to be.
The Goals of Testing

Q. What are the primary goals of your strategy for testing existing applications and new projects?

<table>
<thead>
<tr>
<th></th>
<th>Existing Applications</th>
<th>New Development Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve Quality</td>
<td>78%</td>
<td>80%</td>
</tr>
<tr>
<td>Increase Testing</td>
<td>71%</td>
<td>76%</td>
</tr>
<tr>
<td>Efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accelerate</td>
<td>57%</td>
<td>64%</td>
</tr>
<tr>
<td>Testing Cycles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audit/Compliance/</td>
<td>59%</td>
<td>60%</td>
</tr>
<tr>
<td>Traceability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The perception of ‘digital testing’ is sometimes that quality is sacrificed for speed. A ‘fail fast’ approach to launching services such as new mobile apps is accepted, if lessons are learned, feedback is acted upon and a new, improved offering is put in place ahead of the competition. However, the study found that the need to improve quality remains the top goal of European businesses for testing both existing applications and new projects. That said, speed remains more important in testing new development projects where it is cited as a primary goal by 64% of participants versus 57% in the context of testing existing applications. This is particularly the case in the UK, where 70% of businesses see the acceleration of testing cycles as a primary goal, versus 60% for existing applications. Audit, compliance and traceability is a key concern for businesses in the financial services sector, with 67% listing it as a primary concern for new development projects.
European businesses are taking a diverse approach to ensuring that testing digital applications meet real world requirements. All of the participants in the study use at least two of the four approaches, with virtualization (eg. use of cloud-based platforms such as AWS to create test environments) and real device testing the most popular. UK businesses displayed the most interesting pattern in their approaches, with just 34% testing digital apps in production, with 69% using virtualization. The highest level of in-production testing tended to occur in the less mature markets of Spain (67%) and Italy (60%), although an exception was France, where 69% of participants stated that they undertook testing in production. Companies in the Benelux region are attacking digital testing on all fronts, leading the way in the use of both virtualization (69%) as well as emulators (56%), while 78% also use real device testing. Note that the responses suggest that the majority of respondents were focusing their answers in terms of how they test mobile apps rather than the wider digital landscape (analytics, social etc.)
Digital Testing Monitoring

Q. Do you currently monitor the end user experience and get feedback from your users?

42% Yes
58% No

Q. How do you monitor the end user experience and get feedback?

49% We monitor digital apps and provide this info back to the business
39% We manually get feedback from end users (eg. surveys, user groups)
12% We monitor digital apps but do not provide this info back to the business
Closing the Feedback Loop

A key part of the digital strategies of many businesses is to provide an improved experience to their customers. Take the example of Lloyds Banking Group, which is pumping £1bn into its digital strategy over the next three years, with the goal of “creating the best customer experience,” or Virgin Atlantic, which recently kicked off a multi-million pound investment program designed to refresh ageing mobile and online services in order to “improve the customer experience.”

But in order to do this effectively, organizations need to continuously monitor how users are responding to these new services and to ensure that future development acts upon any relevant insight that is gained as result. The study found that just 42% of European business currently monitor the end user experience and get feedback from users. Given that the large majority of companies see the expansion of their digital presence as their top IT play for the next three years, and that this is largely driven by a need to provide a better experience, this level will need to increase.

There were some interesting regional differences in the results. Businesses in the Nordics led the way, with 88% currently monitoring their end user experience, with participants in the Benelux countries not far behind (78%). The lowest levels were in Spain, and, surprisingly, France where just 27% and 23% respectively keep tabs on the UX.

So how are organizations monitoring end user experience and tracking feedback? Just under one half of those companies that were monitoring user experience said that they did so by tracking the performance of digital applications (eg traffic, usage and pathways of mobile apps) and playing the results back to the business. This was the preferred option among users in mature markets such as the Nordics and the UK. Some 39% said that they manually get feedback from end user groups through surveys and user groups, which while it has its value, tends to be both time consuming and labour intensive and can make it a matter of weeks or months before feedback is acted upon by developers and testers.

Lastly, 12% of participants stated that while they did monitor digital applications, they did not relay the results back to the business, which is surely a missed opportunity. New development and testing cannot be effective if the requirements that they are working to do not match the demands of the user.
New Testing Approaches

Q. How will your digital strategy change your approach to testing and QA?

60% We will become more business process-centric!

40% We will become more applications-centric!

Digital projects are designed to enable businesses to gain value from new technology, but the impact on the testing function appears to be to make it more business process-centric than applications-centric. Some 60% of participants expect this swing towards the business process, which is encouraging as the growing complexity of IT estates means that end-to-end processes can span many different enterprise apps and digital platforms. At a regional level, the general trend is that the more mature markets show a stronger swing towards becoming more business process-centric. Three quarters of UK businesses expect their testing approach to head in this direction as a result of their digital agendas, with organizations in the Nordic region (67%) not far behind. In contrast, just under half of the respondents in both Spain and Italy expect their testing approach to become more applications-centric. There is also a broader shift for the testing function to work more closely with business leadership, and the key drivers are mapped on the following slide.
### Getting Closer to the Business

Q. Which drivers are making your testing function work more closely with business leadership?

<table>
<thead>
<tr>
<th>Driver</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous testing</td>
<td>64%</td>
</tr>
<tr>
<td>Continuous integration</td>
<td>62%</td>
</tr>
<tr>
<td>Organizational changes</td>
<td>59%</td>
</tr>
<tr>
<td>Engagement of SMEs is testing digital processes</td>
<td>57%</td>
</tr>
<tr>
<td>Use of DevOps</td>
<td>48%</td>
</tr>
<tr>
<td>Closer collaboration through intelligent requirements engineering</td>
<td>44%</td>
</tr>
<tr>
<td>Partial adoption of agile test &amp; dev methodologies</td>
<td>41%</td>
</tr>
<tr>
<td>Widespread adoption of agile test &amp; dev methodologies</td>
<td>31%</td>
</tr>
</tbody>
</table>

It is interesting to see that it is IT topics that are the main drivers for moving the testing function towards a closer relationship with business leaders. Continuous testing and continuous integration (where developers integrate code into a shared repository several times a day) are seen as the most important dynamics at play here, as testing is more closely aligned to business requirements and keeps pace with increasingly rapid development cycles. Both are seen as a way to close the feedback loop between the testing function and the business.
Testing Automation

Q. What percentage of your business processes are covered by automated testing and how will this change in the next 12 months?

<table>
<thead>
<tr>
<th>Percentage</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%-100%</td>
<td>0%</td>
<td>7%</td>
</tr>
<tr>
<td>50%-80%</td>
<td>8%</td>
<td>21%</td>
</tr>
<tr>
<td>30%-50%</td>
<td>25%</td>
<td>23%</td>
</tr>
<tr>
<td>10%-30%</td>
<td>26%</td>
<td>23%</td>
</tr>
<tr>
<td>&lt;10%</td>
<td>41%</td>
<td>26%</td>
</tr>
</tbody>
</table>

Test automation is set to be a major focus for European businesses during the next 12 months. The study found that a large proportion (41%) of organizations currently have less than 10% test automation coverage of their business processes. This is interesting as many other market surveys have typically found a much higher rate, but we think that this is because this study focused on business process rather than test process automation. But automation is clearly on the rise, with the percentage of businesses with coverage of more than 50% growing from just 8% to 28%. There are some interesting differences at a regional level. Italian businesses are bottom of the pile, with a huge two thirds of participants stating that less than 10% of processes are supported with test automation. In contrast, organizations in the Benelux and Nordic territories lead the way, with one third of respondents in each market having between 30% to 50% of their processes supported with test automation.
4. Resourcing Strategies
In-House vs External

<table>
<thead>
<tr>
<th>Percentage</th>
<th>In-house</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>75%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>100% outsourced</td>
<td>4%</td>
<td></td>
</tr>
</tbody>
</table>

The recruitment of the right skills was raised as an important digital testing challenge by 80% of participants. In that context, it is interesting to see that many European businesses continue to use largely internal teams to deliver their testing requirements with 43% using 100% captive operations. The use of external resources is strongest in the Benelux region, where just 39% use 100% internal resources, and 28% outsource 75% of their testing requirements. The most aggressive use of outsourcing is in the UK, where 6% of participants claim to outsource 100% of their testing functions. This backs up the UK’s status as the most mature sourcing location in Europe, which has been driven in part by the adoption of offshore sourcing models during the 2000s as businesses took advantage of the labour arbitrage benefits of locations such as India. Given the challenge that many participants acknowledge around digital resourcing, we would expect a growing number to leverage the larger talent pools at their disposal from external services suppliers.
The focus for many testing functions during the last decade has been to centralize and standardize in order to build the scale and robustness required to support group-wide testing in the most efficient way. This is reflected in the results of the study, which show that almost one third of European businesses claim to have 100% centralized testing functions, with a further 49% having between 50%-75% centralization. This trend is strongest in the Benelux region, where 39% have 100% centralized functions, and in Italy, where 40% of participants claimed 100% centralization. The complex, heavily siloed structure of many large Italian conglomerates has made the development of shared testing services a key focus area as part of corporate cost efficiency drives. It is encouraging to see that as software quality becomes an increasingly important issue, only 4% of the participants in the study did not have a dedicated testing team in place.
One of the biggest dilemmas facing European testing leaders is how they should staff digital projects. Do they need to build separate teams with the freedom to embrace new tools, methodologies and ways of working to meet the often challenging release cycles, or can they leverage the existing resources? According to the study, 63% of European businesses use the same teams to support both existing apps and new projects, with the trend strongest among French organizations (77%). Nordic business are the most aggressive in taking a two-pronged approach, with 48% using separate teams. There are pros and cons to both approaches. Using the same resource team can ensure continuity and a standard position on quality – a very important issue for businesses operating in markets with tough compliance demands such as financial services. However, building a dedicated digital team can help accelerate the launch of the company’s digital services by unchaining the testers from the often onerous demands of supporting critical legacy platforms.
Digital Testing Frequency

Q. What is your frequency of testing digital processes?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Based</td>
<td>51%</td>
</tr>
<tr>
<td>Monthly</td>
<td>14%</td>
</tr>
<tr>
<td>Daily</td>
<td>13%</td>
</tr>
<tr>
<td>Quarterly</td>
<td>12%</td>
</tr>
<tr>
<td>Less Frequently</td>
<td>11%</td>
</tr>
</tbody>
</table>

Digital initiatives have different testing requirements, ranging from the highly complex (testing of a new group-wide analytics platform or e-commerce engine) to the simple (launch of mobile app update). As a result, the frequency with which businesses need to test their digital processes also varies. The study found that the majority (51%) of European businesses test their digital processes on a project basis, with more than a quarter testing on either a monthly or quarterly basis. This may be a perfectly reasonable approach given the level of risk or change that sits within the processes in question, but the general trend that we see in the market is towards more regular testing, as the pace of digital change accelerates. Just 13% of participants (of which a third were based in the Benelux region) test on a daily basis, and we would expect this level to increase in the coming years as the need for a more agile testing approach becomes paramount. There is an interesting overlap between the tendency towards project-based testing and the use of non-dedicated resources for digital testing projects. Project-based testing requires interdisciplinary teams, while regular testing of digital apps as part of a release cycle could be performed by stand-alone specialist resources.
5. Testing Investment Priorities
European businesses expect to pump more of their testing budgets into *new development projects* over the next two years. The study found that while 23% of companies currently allocate *more than 60%* of their budgets to new development in 2015, this will increase to a level of 27% in 2017. And while more than 30% of participants invest as little as 20% or less of their budgets in supporting new projects, this will shrink to 23% over the next two years. The study found that budget pressure remains the primary challenge testing executives in 2015, so it is encouraging to see that it is the testing of existing applications that is likely to see strongest focus in terms of efficiency during the next two years.
Mobile testing will be the top investment hotspot for European testing executives in 2016. Some 65% of participants in the study plan to increase spending in this area, but more than half of organizations plan to ramp up investment in Agile and DevOps. There were some interesting trends at a regional level. Businesses in Spain (80%) have the strongest appetite for increasing their investment in Agile, with the likes of banking giant BBVA using it as a key pillar of its ambitious digital transformation program. UK businesses (69%) have the highest level of planned investment in mobile technology, while organizations in the Nordic region (68%) will lead the way with the adoption of DevOps. While previously a heavily technical topic that had the greatest uptake among the open source developer communities, DevOps has rapidly caught up in the corporate IT department. It is intriguing that while many respondents identified continuous testing and integration as a driver for bringing testing closer to the business, slightly fewer see it as a priority area for investment – possibly because organizations see it as a cultural transition as much as one that requires investment in new technology. Businesses across all sectors are looking to reshape their operations to take advantage of cloud, mobile and analytics technologies, and the sheer pace of this digital transformation is driving demand for faster and better quality release cycles. This has increased the profile of DevOps as well as Continuous Delivery/Continuous Deployment practices during the last 18 months.
Testing Tools Preferences

Q. Which testing tools are of importance in supporting the testing of new projects?

- **In-house developed tools**: 65%
- **Open source tools**: 62%
- **Traditional commercial QA suites**: 59%
- **Emerging/next-generation commercial tools**: 45%

Percentages refer to percentages of participants citing these areas as playing a primary or secondary role in supporting digital testing.

Testing functions have an increasingly diverse set of tools at their disposal to support new projects. The study found that the majority of European businesses rate internal testing tools as their most important weapon in supporting digital testing, with companies in the Nordic region (76%) and the UK (69%) leaning on them the most. The scalability of internal tools will come under pressure as the digital transformation programs of the business are rolled out, and if testing functions want to hit their targets in terms of increasing the level of test automation supporting their key business processes, they are more likely to look to leverage tools from external providers. **Open source tools** are seen as important by 62% of European businesses, with their biggest fans being Italian (87%) and Spanish (67%) businesses.
As we have seen, European businesses work with a variety of different tool sets. But what are the criteria by which they select them? ‘Ease of use’ is rated as being of ‘high importance’ by more than half of the participants, which ranked it ahead of ‘ease of deployment’ (48%) and ‘platform/technology coverage’ (46%). The impact of digital is an important factor behind this drive towards easy-to-use and easy-to-deploy tool sets in order to support faster testing cycles, as well as to support a closer collaboration between testing and business users. Functionality also remains important, with 76% of participants rating ‘comprehensiveness of features’ as being of high or medium importance.
Crowdsourcing has emerged as one of the hottest topics in the testing world. The model, which sees businesses tap into global communities of freelance testers via online platforms to test websites, mobile apps and other software, has won many high-profile adopters such as Amazon, Coca Cola and Netflix. The study founds that crowdsourcing is gaining momentum in Europe, with almost a quarter of businesses already using it, and a further 20% planning to adopt it in the next two years. Crowdsourced testing is strongest in the Nordic region, where 16% of businesses already use it and plan to increase their use in the short term. The UK and Germany look set to be the most dynamic markets for the next two years, with 23% of participants in both countries planning to leverage crowdsourced testing during that timeframe. The first wave of crowdsourced testing has tended to focus on “in the wild” rather than “laboratory” testing, in support of areas such as public-facing systems such as websites or mobile apps, rather than functional testing or legacy applications.
6. Conclusions
The digital agenda is having a profound impact on the testing strategies of many European organizations. It is moving testing closer to the business, it is driving them to leverage different tools, methodologies and external partners, and it is forcing them to move at greater speed. It is also posing major new challenges in terms of resourcing, culture, consistency and integration with the legacy environment.

There isn’t a right and a wrong way of approaching the digital testing challenge. Our study found that the majority of businesses are using the same teams to test both new development projects and existing applications, and for some, this may be the best approach – particularly if their core testing team has the bandwidth and mind set to embrace new approaches and tools to keep up with the pace of their company’s digital ambitions.

For others undergoing a more radical digital transformation – and we are seeing some dramatic change programs taking place across all industry sectors from banks to public sector agencies – the best solution may be a two-pronged approach. In this case, the challenge will be in bridging the gap between the two sides, to ensure quality as well as speed. It is not surprising that many businesses are increasingly looking to leverage external tools and expertise to help them on this journey.

One of the most interesting findings is that quality remains the most important driver for both testing existing applications and digital projects. Digital may be shaking up the testing function, but the ultimate goal remains the same – to drive continuous improvement in the quality of software, which in the digital age has become the lifeblood of the business.
Appendix
Disclaimer, usage rights, independence and data protection

This study was compiled in multi-client mode under the sponsorship of Accenture, HP, TestPlant, Applause and Worksoft

For more information, please visit [www.pac-online.com](http://www.pac-online.com).

**Disclaimer**
The contents of this study were compiled with the greatest possible care. However, no liability for their accuracy can be assumed. Analyses and evaluations reflect the state of our knowledge in September 2015 and may change at any time. This applies in particular, but not exclusively, to statements made about the future. Names and designations that appear in this study may be registered trademarks.

**Usage rights**
This study is protected by copyright. Any reproduction or dissemination to third parties, including in part, requires the prior explicit authorization of the sponsors. The publication or dissemination of tables, graphics etc. in other publications also requires prior authorization.

**Independence and data protection**
This study was produced solely by Pierre Audoin Consultants (PAC). The sponsors had no influence over the analysis of the data and the production of the study.

The participants in the study were assured that the information they provided would be treated confidentially. No statement enables conclusions to be drawn about individual companies, and no individual survey data was passed to the sponsors or other third parties. All participants in the study were selected at random. There is no connection between the production of the study and any commercial relationship between the respondents and the sponsors of this study.
Founded in 1976, Pierre Audoin Consultants (PAC) is part of CXP Group, the leading independent European research and consulting firm for the software, IT services and digital transformation industry.

CXP Group offers its customers comprehensive support services for the evaluation, selection and optimization of their software solutions and for the evaluation and selection of IT services providers, and accompanies them in optimizing their sourcing and investment strategies. As such, CXP Group supports ICT decision makers in their digital transformation journey.

Further, CXP Group assists software and IT services providers in optimizing their strategies and go-to-market approaches with quantitative and qualitative analyses as well as consulting services. Public organizations and institutions equally base the development of their IT policies on our reports.

Capitalizing on 40 years of experience, based in 8 countries (with 17 offices worldwide) and with 140 employees, CXP Group provides its expertise every year to more than 1,500 ICT decision makers and the operational divisions of large enterprises as well as mid-market companies and their providers. CXP Group consists of three branches: Le CXP, BARC (Business Application Research Center) and Pierre Audoin Consultants (PAC).

For more information please visit: [www.pac-online.com](http://www.pac-online.com)
PAC’s latest news: [www.pac-online.com/blog](http://www.pac-online.com/blog)
Follow us on Twitter: [@PAC_Consultants](http://twitter.com/PAC_Consultants)