2013 Trends in Automated Testing
For Enterprise Systems

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Scope

This report presents the results of an industry market research survey commissioned by Worksoft Inc., and performed by an independent third party in order to study the state of test automation in operating companies. The extent and reasons for the adoption of automated testing are explored for large companies that use packaged enterprise applications, such as SAP®. Factors driving adoption, including an analysis of business benefits are presented, as well as results on the extent of mobile, cloud, and agile initiatives in these companies - factors that are also driving the expansion of test automation.

Results include responses from 699 respondents at 504 companies, primarily located in North America and Europe, and most with annual revenues greater than $500 million USD. The overwhelming majority (93.4%) are companies that use SAP, although a small number use other packaged software as their primary ERP system.
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Executive Summary

Key findings of this market research (performed in November and December 2012) include the following observations:

**Test automation is a significant area of investment for 2013.** Of the 594 responses related to investment, 204 (34.3%) indicated planned additional investment in automated testing and software quality assurance in the next 12 months. Only 24.6% indicated no planned investment in this area. The current rapid adoption rate of test automation is likely to continue through 2013.

**Market awareness of highly automated testing is very high.** When asked whether they believe that most of SAP-related business processes can effectively be tested with test automation software, 68.1% of respondents said that today’s functional testing software can provide high levels of automation (covering more than 50% of the company’s critical business processes). The majority believe that suitable technology exists today and that high levels of test automation can realistically be achieved. This represents a significant maturing of the market for test automation software, and helps to explain the current rapid adoption of this technology.

**Automated testing delivers business benefits in multiple areas for most companies.** More than 4-out-of-5 firms using test automation identified business benefits of test automation in multiple areas (86%), with most respondents identifying 3 to 6 different areas of benefit. The 5 top-ranked areas of value were:

- Greater staff efficiency and time savings
- Early identification of defects before business users are impacted
- Higher quality in business processes and the software that supports them
- Greater accuracy in catching more defects
- Faster deployment of innovation and new features for business users

The survey results clearly indicate that global companies are increasingly realizing the substantial benefits of test automation.

**Significant opportunity exists for additional growth in adoption of test automation.** Overall, the market penetration of highly automated testing is still relatively low with 49.8% of respondents reporting that most of their SAP testing is performed manually, and an additional 22.1% reporting that less than 20% of their functional tests are automated. In other words, about 70% of respondents are realizing low levels of automation at 20% or less. Still, about 28.2% of respondents have achieved moderately high or very high levels of test automation -- 40% automated testing or more. At the most highly automated companies, 5.8% report that more than 80% or “nearly all” of their functional testing is automated.
Testing is increasingly seen as an essential competency. The number of companies with a “testing center of excellence” (tCOE) in place or with plans to start one was substantial – 41.6% of responses. About 26% have a tCOE in place already, and another 16% have plans to start one or are considering it. This is also an indicator of increasing market maturity in test automation.

One of the most interesting results of the survey highlights the potential for highly automated testing in operating companies. Most professionals in the space – more than two thirds -- are aware that software is available today that can deliver very high levels of test automation. On the other hand, the reality is that most companies today are still relying mainly on manual approaches. So the potential is large for continued strong adoption of automated testing, given the high industry awareness.

The important conclusion for operating companies is that there exists a large, untapped pool of economic benefits that are yet to be claimed through highly automated testing. Over the next 5 years, we believe that companies will increasingly realize economic benefits in cost savings, improved business agility, efficiency and quality. Harvesting economic benefits will continue to drive the industry’s shift toward highly automated testing and away from manual approaches, as companies continue to push for higher quality execution and greater business agility at lower cost.

Some companies are well ahead of their peers. A significant number – about 41% – of surveyed firms have embraced testing as a valuable core competency, as indicated by the establishment of current or planned testing centers of excellence. A number of large companies report having achieved high levels of test automation – 60% to 80% automation or more in some cases. This is significant since this group represents the industry’s proof points that high levels of automated testing are not only possible, but are actually being achieved at top performing firms – and delivering important business benefits. These leading companies have a competitive advantage today in cost management, in the quality of their business process execution, and agility in the deployment of innovation.

Like most competitive advantages, there is a window of opportunity now for operating companies to seize the benefits of highly automated testing more quickly than their peers and competitors. That window will likely close in the medium term, as test automation becomes broadly adopted, raising the bar for all industry players as it becomes standard “must have” technology over the next 5 years.
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Demographics: Company and Respondent Profiles

The survey was conducted in November 2012 and responses were received from 699 respondents at 504 companies. The overwhelming majority (93.4%) were companies that use SAP, although a small number use other packaged software as their primary ERP system. The majority were large firms with revenues greater than $500M USD.

![Pie chart showing 93.6% SAP, 6.4% Non-SAP](image)

Because the focus of the study is on operating companies that use SAP, the analysis for most topics focuses on the 650 respondents from the 475 companies that use SAP. A small number of consultant responses were excluded from analysis.

While the study targets companies that use SAP, the focus is by no means limited to SAP software only. The reality is that nearly every large company has multiple enterprise systems in place to support their end-to-end business processes, including web-based, mobile, and cloud based technologies.

In an earlier survey of 25 CIO and VP level executives at large companies, when asked “In addition to SAP, how many applications are in your Enterprise Application Portfolio?” the median answer was 12 different enterprise-level applications! Another recent survey of mid-tier companies reports the use of between 3 and 7 enterprise applications at the typical mid-tier operating company. SAP is often just one of them. For these reasons, a discussion of testing and quality assurance must span the full enterprise application portfolio.
The majority of respondents were located in North America and Europe.

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>76.3%</td>
</tr>
<tr>
<td>Canada</td>
<td>12.1%</td>
</tr>
<tr>
<td>EMEA</td>
<td>11.1%</td>
</tr>
<tr>
<td>Central/South America</td>
<td>0.3%</td>
</tr>
<tr>
<td>APAC</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

“What is your group or department? (Select all that apply)”

The majority of respondents (76.1%) indicated that they were part of an IT organization, although Finance and Accounting, Supply Chain Management & Logistics, Human Resources, and Purchasing are also well represented in the survey results.

Combination responses were common, with about a third of respondents indicating a secondary affiliation, such as IT + Finance, or Supply Chain Management + Center of Excellence. A small number indicated “Other” and these included compliance, manufacturing, and analytics services roles, for example.
“What is the most important reason for deploying SAP updates at your company?”

The deployment of new features for business users (42.6%) was a more important reason for deploying SAP updates than repairing defects in the software (35.9%), but not by a large margin. Deploying features for the improved administration of SAP was important to some respondents (10.8%). The balance explained other reasons.

Most interesting are the additional comments by some respondents on their reasons for deploying SAP updates:

- “Support Packs for updates and HR/Legal notes for end of year activities”
- “Definitely annually with HR Support Packs, but probably more frequently with applying OSS Notes sporadically as bugs are found in the software. We are running HR, FI, ESD, CCS SR”
- “Great Britain legal changes”
- “New functionality to keep environment current”
- “Staying current”
- “Keeping environments up-to-date in the event we need to raise OSS message (where first reply is often to update latest patch)”
- “Company policy and SOX”
- “Annual tax updates for payroll”
- “Maintain compliance with SAP support and legal requirements”
- “Ensuring we stay up-to-date when implementing SAP add-ons”
- “Those required by SAP to implement the new GL”
• “Statutory changes”
• “For year-end payroll changes”
• “1099 and W-2 changes” (for US taxes)
• “Legal updates”
• “Legal reasons, needing to be current”
• “HR required Support Packs”
• “Mostly Support Packs for Human Resources”
• “Applying Support Packs and/or legal change Packs”
• “Deploy SAP service packs twice a year to support HR. These could include Basis and Cross Application Components. Major upgrades depend on project activity and what’s needed to support the business requirements.”
• “HR Support for 6+ country’s payrolls within SAP”
• “Tax regulatory updates for Payroll”
• “Updating the tax tables and year end HR/PY support packs.”
• “Staying current on a version which remains under support with SAP”
• “HR updates”
• “Updates as part of year end HR”
• “OSS Notes and normal maintenance upkeep”
• “Managing local change requests and fixes”
• “HRSP bug fixes”

In summary, important drivers for many companies are the required changes in legal, tax, payroll, and HR administration that must be deployed to support these functions. The point to emphasize here is that these updates are viewed as mandatory rather than optional by many companies to ensure the proper execution of essential business processes – either to comply with regulations or internal corporate policies. The desire to “stay current” and keep the environment “up-to-date” is also a common thread.
“How many times per year does your company deploy updates to SAP?”

Given the similarity in the reasons for deploying updates, companies reported widely differing results in the timing of updates. Roughly equal numbers deploy updates monthly, quarterly, semi-annually, or annually. The spread is surprising.

We believe that one reason for this spread is that our survey question was quite general and did not differentiate between different types of “updates.” Clearly, a major upgrade is not the same as an HR Support Pack.

Nevertheless, the sample size (n=647) is sufficiently large that some interesting observations can be made, even at this general level. About 43.1% of companies have processes in place to deploy updates at a frequency of 3 months or better. By any measure, this represents a good ability to deploy new business functionality, innovation, and bug fixes in a timely manner. Of these, 19.8% lead the field and report that they have the ability to deploy updates on a monthly basis or better.

In contrast, about 44.7% of their peers are less agile. They perform updates at a frequency ranging from 6 to 12 months. Still, this frequency is sufficient to stay generally up to date with important legal, compliance, and tax updates that must be deployed annually.
A significant number of respondents – 78 people representing 77 different companies and 12.1% of the results - note that their companies perform updates on a less-than-annual basis. Just so you don’t think these are small or generally low performing companies -- many of these are large global firms with revenues greater than $1B USD.

Clearly, there are leaders and there are laggards when it comes to agility in deploying SAP updates.
“Is the frequency of SAP updates adequate?”

When asked whether they felt more frequent deployment of updates would benefit the business, a significant number -- about one third or 187 respondents at 185 companies -- believed there was business value in more frequent deployments of SAP updates. About two thirds of respondents (n=387) said that the status quo was “about right.”

![Pie chart showing 67.8% favor the current deployment rate, 32.2% believe more frequent deployments would benefit the business.]

We also analyzed how these results varied across different job types and departments in an organization, and were surprised to find little difference in responses across job types. The overall responses from both IT and non-IT professionals differed by less than 2%. In other words, both IT and non-IT professionals had similar views on this question.
As might have been expected, companies that made SAP updates more frequently were somewhat more satisfied with their current frequency of updates than firms that made less frequent updates. In other words, the more updates you did, the less you felt the need to do more for the business.
“How are most SAP software defects identified in your company?”

While most companies report that defects are primarily identified by the SAP support staff through their testing efforts (54.9%), a significant number of respondents report that most defects are identified by business users during the course of normal business activities (45.1%).

![Pie chart showing 54.9% identified by SAP support team and 45.1% identified by business users]

Obviously, if there are software defects to be found, better to catch them early in a rigorous testing process, before there is any impact on business users. If business users find defects during the course of their day-to-day activities, then there could be a detrimental impact on the business -- costly mistakes, oversights, impacts on suppliers or customers, and other generally undesirable outcomes. In addition, the cost of repairing a defect is significantly lower if found before changes are deployed in production.

In many cases, software defects are small matters without serious consequences other than frustration for business users and the incremental cost of reporting, tracking, analyzing, repairing, and deploying fixes. However, in some cases software defects can have serious business and financial consequences that materially impact business performance.
The detailed responses to this question are summarized in the bar chart below. The left hand side of the chart represents companies with top performance. Of the 641 responses, 176 (27.4%) reported that less than 20% of their defects are first identified by business users. This is very good performance by these companies and their SAP support teams – defects are identified early and generally resolved in a way that is transparent to the business. The right hand side of the chart represents companies with poorer performance. At this end of the spectrum, 65 respondents (10.1%) said that nearly all of their defects were identified by business users. Of these, 26 reported that the number was 100% -- meaning that essentially zero were identified through testing processes. For these organizations, substantial room for improvement exists and they could be doing better relative to their peers.

In summary, the survey responses indicate that 50% to 70% of companies could probably be doing more to catch defects earlier in time, before business processes are impacted. The use of enterprise software brings with it a certain level of technology risk. As shown by these results, detecting defects early is possible at top performing companies, and is an effective way to manage a significant part of this technology risk.
“Does your company track the number of SAP defects identified and resolved?”

The good news on this front is that more than two thirds (66.8%) report that their firms have tracking processes in place on an on-going basis to track defects that have been identified by business users and their testing teams (n = 621 responses). Another 15% have such processes, but use them only on a project basis. Finally, 7.9% (49 companies) have no defect tracking processes in place.

In summary, the clear majority of companies have processes in place to track defects – which is very good -- but about 20% of companies could likely be doing more to track enterprise system defects and issues.
“How does your company test SAP and connected business software prior to deployment of updates?”

This question explores whether SAP updates are tested prior to deployment and how. Nearly all companies test SAP updates. Only 3.9% report that they actually “do very little testing.”

Over 90% of 622 respondents to this question perform manual testing prior to the deployment of updates and 39% do some level of testing using automation software. Also, 197 respondents (32%) report that their company uses a combination of both manual and automated testing approaches. (Hence, the percentages add up to greater than 100%.)
“How much of your SAP testing is done using test automation software?”

This question explores the level of automation in SAP testing. Of 621 responses, about half (49.8%) report that almost all of their SAP testing is done manually, and another 22.1% have automated less than 20% of their functional testing. Still, 28.2% have automated 40% or more of their testing, which is higher than expected and represents very good industry performance for these companies.

At the very top end of test automation performance, 5.8% (36 companies) report that highly automated testing is in place and that their companies are achieving more than 80% automation in their testing activities. This is significant since this group represents the industry’s proof points that high levels of automated testing are not only possible, but are actually being achieved at top performing firms – and delivering important business benefits in agility, staff efficiency, quality, and cost savings. The 80% automation level in functional testing “sets the bar” for top companies and represents outstanding performance.

Some in the industry have termed this “flipping the 80/20 equation” as companies make the transition from “80% manual and 20% automated testing” to “80% automated and 20% manual testing” over time. In any case, we expect the level of test automation to continue to increase rapidly over the next few years.
“How much of your non-SAP testing is done using test automation software?”

For testing of systems beyond SAP, results show that the level of manual effort is higher, and the level of automation is generally lower in the testing of non-SAP applications when compared with SAP testing.

Of 615 responses, about 60% of survey respondents noted mainly manual testing activities which are fully 10 percentage points higher than for SAP testing. At the high end of automation performance, 9.6% note test automation levels greater than 60%, compared with 13.2% achieving greater than 60% automation levels for SAP testing. Still, these top performing companies have significant business advantages relative to their less automated peers because of the overall high level of test automation.

As noted earlier, ensuring integrity in end-to-end business processes requires effective testing of both SAP and non-SAP systems, since the typical global enterprise has up to a dozen different enterprise business software applications. These results show that top performing firms apply highly automated testing for both SAP and non-SAP applications.
“Do you believe that most (more than 50%) of your SAP-related business processes can be effectively tested with test automation software?”

When asked whether they believed that most of their SAP-related business processes can effectively be tested with automation software, 68.1% of respondents said that today’s functional testing software can provide high levels of automation (covering more than 50% of the company’s critical business processes). This represents 407 out of 598 responses. Less than one third said that they believed their processes and systems are too complex and unique for test automation to be effective.

This is a particularly significant result, because it implies that market awareness of highly automated testing is very high. It means that most professionals believe that suitable technology exists today and that high levels of test automation can realistically be achieved. This represents a significant maturing of the market for test automation software, and helps to explain the current rapid adoption of this technology in the industry.
“What benefits of test automation are most important to your company?”

There were 466 responses to this question that identified specific business benefits of test automation:

- Greater staff efficiency in our testing – it saves time
- Early identification of defects – before business users are impacted
- Higher quality in our business processes & the software that supports them
- Greater accuracy in catching more defects – before users are impacted
- Faster deployment of innovation and new features for business users
- Reducing the cost of maintaining SAP and related software
- Faster completion of SAP projects
- Manual testing is difficult to manage. Automation is easier
- Increased frequency in deploying SAP updates
Nearly two thirds of respondents (63.8%) indicated that greater staff efficiency in testing was an important business benefit, making it the overall number one ranked business benefit of test automation. The next three most highly noted benefits were all related to quality – early identification of defects before business users were impacted, higher quality in business processes and the software that supports them, and greater accuracy in catching more defects. To round out the top 5, the fifth most noted benefit of test automation was the faster deployment of innovation and new features for business users. In other words, benefits in business agility.

Respondents could identify more than one benefit area or provide their own commentary. Interestingly, 13.9% identified only one primary benefit area, but an astonishing 86.1% of companies using test automation identified more than one area of benefit. In fact, most respondents identified between 3 and 6 different types of business benefits. This was quite unexpected and another confirmation that the marketplace as a whole is recognizing the substantial value of highly automated testing for SAP and other enterprise applications.

Additional interesting comments from respondents regarding benefit areas included:

- “Automation handles virtually all regression testing during normal deploys.”
- “Regression testing.”
- “End-to-end regression testing after code deployment is done in SAP.”
- “Facilitating automation in place of manual entry into production (for testing purposes).”
There were some doubters out there regarding test automation who responded “we don’t use test automation” for the following reasons:

- “Complex business processes don’t lend themselves well to automated testing.”
- “We have too much change for test automation to work effectively.”

Proponents of test automation would say that it is exactly the complexity of today’s enterprise software environments and the rapid pace of change that drive the need for higher levels of automation. Another respondent commented on the cost of test automation:

- “Testing lead indicates that it is too expensive to set-up and maintain automation scripts.”

The reality is that with today’s leading test automation software, script-free test management is not only possible, but has proven to be highly cost effective. The economics are very much in favor of highly automated testing over manual approaches. Numerous case studies exist that confirm these findings. See [http://www.worksoft.com/resources/publications.html](http://www.worksoft.com/resources/publications.html).

Some respondents noted limitations in first generation, script-based test automation tools:

- “We have automated scripts in certain areas within SAP which work well as these functional areas are fairly stable. However, we’ve found the automated scripts aren’t easy to maintain when you do major upgrades or if screens change.”

This problem is virtually eliminated with the advanced architecture of today’s leading testing automation tools, such as Worksoft Certify®.

One user identified multiple benefit areas, including the caution “test automation is still an investment...a lot of work to put in place and maintain afterwards.” Another highlighted the fact that the deployment of test automation is often uneven across an organization, “We use automated testing, but not for SAP.”

Manual testing will continue to play an important role, even for organizations that adopt highly automated testing. One respondent said that in addition to test automation, “we continue to use some manual tests to ensure that user found defects are uncovered.”

A number of respondents also talked about future plans:

- “Getting started with automation testing... It’s not there yet!”
- “We don’t do any SAP automated testing now, but we plan to in the near future.”
In summary, the business case for test automation is well understood with 86% of respondents noting multiple business benefits for test automation. Most noted between 3 and 6 benefits in the areas of staff efficiency, improved quality, increased business agility, and cost control. One of the most succinct benefit statements which seemed to summarize the views of many respondents was from one IT professional who uses highly automated testing to deploy technology updates on a monthly basis. For his company the value is in, “Faster test cycles, less business user impact.” Well said.
“Do you expect to see your business use more mobile technology in the next 12 months?”

Of 595 responses, a large majority (69.4%) expect to see greater use of mobile technology in their businesses. Only 12.4% did not.

When asked an open-ended question to identify areas of the business where they expect to see more mobile technology, responses were wide ranging and clustered in the following areas:

<table>
<thead>
<tr>
<th>Customer Facing</th>
<th>Number of Mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales, Order Processing, Marketing</td>
<td>21</td>
</tr>
<tr>
<td>CRM</td>
<td>11</td>
</tr>
<tr>
<td>Field Services Engineer &amp; Field Operations</td>
<td>4</td>
</tr>
<tr>
<td>Customer Service and Support</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operations</th>
<th>Number of Mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation, MRO, Inventory, Warehouse, Maintenance</td>
<td>11</td>
</tr>
<tr>
<td>Manufacturing Operations</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business Intelligence &amp; Management Reporting</th>
<th>Number of Mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI, Dashboards, Web Analytics, Reporting, Business Analytics</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process and Workflow</th>
<th>Number of Mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Processes, Workflow Approval, Notifications</td>
<td>8</td>
</tr>
<tr>
<td>IT Service Management</td>
<td>1</td>
</tr>
<tr>
<td>Finance</td>
<td>1</td>
</tr>
<tr>
<td>Backoffice</td>
<td>1</td>
</tr>
</tbody>
</table>
The responses show that number of applications in the “Customer Facing” category led the “Operations,” “Business Intelligence & Management Reporting,” and “Process & Workflow” categories by a margin of more than 3-to-1.

Several of the most interesting comments from respondents include:

- “Our customers are demanding this more and more.”
- “Customers are demanding mobility improvements, including bring-your-own-devices.”
- “iPads and Samsung tablets for a nomad workforce (sales and field service engineers). Middleware to offer access to back end systems, ERP, and CRM.”
- “Mobile virtualization (virtualized desktop delivered to mobile devices)”
- “Streaming dashboard reports to iPad or iPhone devices”
- “Use of iPads and other mobile devices.”
- “There is interest.”

For the record, the most mentioned device names in the text responses were the iPad, iPhone, and Samsung devices.

Clearly, many companies are still in the process of developing their mobile strategies. (For more on this topic please see http://www.worksoft.com/files/resources/Worksoft-Partner-Publication-Keynote-Mobile-Testing-for-SAP.pdf.) About 18% of the responses were “Don’t know” when asked about their mobility plans. However, the number of companies still developing mobility strategies is likely higher because even among the “Yes” responses there were those who clearly were still in the planning stages or see mobility deployments somewhat in the future:

- “Not sure yet, but I expect to see it.”
- “We would like to get into mobile, but it probably won’t happen within 12 months.”
- “Lots of discussion and interest in this area. Not sure if it will reach a top priority.”
- “Yes, though relatively slow additions in the short term.”
- “Within 2 years we might for our sales people.”

In summary, the results show a high expectation regarding the adoption of mobile technology for businesses with nearly 70% of respondents expecting further adoption over the next 12 months. Strongest expectations for business adoption of mobile technology are in the outward facing functions of sales, customer support, CRM, and field services. However, the areas of business intelligence, logistics and operations, and the general area of workflow automation were also noteworthy areas of growing mobile adoption. While some companies are still studying the impact of mobility and still “not sure” of their own strategy, others mention a strong push from customers to provide mobile applications to leverage the benefits of mobility.
“Does your company have an “agile business” strategy in place or an agile initiative?”

In contrast to the prior question on mobility, awareness of agile business or other agile initiatives was generally lower, with about two thirds of respondents either unsure or not aware if their company had agile initiatives. Still, of the 592 responses a very sizable number (36.1%) of companies (n=214) did have some level of agile initiatives in the IT area or elsewhere.

![Pie chart showing responses to agile initiatives question]

When we compare the set of companies with agile initiatives (214) with the set of companies (231) that identified “faster deployment of innovation and new features for business users” as a business benefit, we see a strong relationship. About half the companies (49.1%) that identified the deployment of innovation as being important also had agile initiatives in place. While this was expected, it was good to see it confirmed in the survey results.

When asked about the business benefits of test automation, 231 respondents (39% of the users of test automation) had identified the “faster deployment of innovation and new features for business users” as an important benefit – among of the top 5 overall. The rapid deployment of innovation is one important part of business agility that is enabled by highly automated testing.
We also asked an open ended question about specific areas of agile initiatives. Where respondents did indicate a specific agile business initiative, the results clustered as follows:

<table>
<thead>
<tr>
<th>Agile Business Initiative Area</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>15</td>
</tr>
<tr>
<td>Software Development</td>
<td>11</td>
</tr>
<tr>
<td>Business Intelligence &amp; Analytics</td>
<td>5</td>
</tr>
<tr>
<td>e-Commerce</td>
<td>5</td>
</tr>
<tr>
<td>Web Development</td>
<td>4</td>
</tr>
<tr>
<td>Forecasting, Planning, and Financial Systems</td>
<td>3</td>
</tr>
<tr>
<td>CRM and Field Sales</td>
<td>2</td>
</tr>
<tr>
<td>HR and Labor Systems</td>
<td>2</td>
</tr>
<tr>
<td>Logistics/Supply Chain</td>
<td>2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2</td>
</tr>
<tr>
<td>Product Development</td>
<td>2</td>
</tr>
<tr>
<td>Banking &amp; Markets</td>
<td>1</td>
</tr>
<tr>
<td>Clinical Systems</td>
<td>1</td>
</tr>
<tr>
<td>Mobile Devices</td>
<td>1</td>
</tr>
</tbody>
</table>

Not surprisingly, the areas of IT, Software Development, and Web Development accounted for the majority of the responses. One respondent even noted their specific responsibility:

- “I am responsible for the development team, and integration with functional teams & end users for Agile deployment of new enhancements.”

Beyond that, initiatives were broadly spread across e-commerce, financial and planning systems, manufacturing, logistics, supply chain, product development, HR, and other areas. For some companies, agile approaches are quite broadly adopted:

- “It’s part of our Kaizen methodology.”
- “All areas.”
- “Across many functions.”
- “We use agile processes throughout our company.”

As mentioned earlier, highly automated testing shortens project timelines and can increase the frequency of technology updates. Both of these increase business agility in the rapid deployment of innovation to business users.
“Do you expect to see cloud deployments of software in your company in the next 12 months?”

Out of 593 responses, 275 respondents (46.4%) indicated that they expected to see more cloud deployments of software in 2013. Only about a quarter indicated no additional cloud deployments.

As more and more applications shift to cloud-based deployment, there are important impacts on systems testing and quality assurance. When cloud-based applications are controlled by a third party, these service providers often make automatic updates to software according to their own schedules, not yours! This means that operating companies often face the question: “How do I ensure that our business processes continue to work properly, given software changes that I do not always control?”

The answer is that a well-designed test automation program can ensure that business process tests are performed in a complete and systematic way, and on a regularly scheduled basis. This ensures that issues are detected early – before business users are impacted – and can be promptly addressed, even in dynamic cloud application environments.
When asked an open ended question regarding where cloud deployments were most likely to occur in their companies, the responses were wide ranging:

<table>
<thead>
<tr>
<th>Areas of Cloud Deployment</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRM (including Salesforce.com)</td>
<td>6</td>
</tr>
<tr>
<td>HR &amp; Learning</td>
<td>5</td>
</tr>
<tr>
<td>Sales, Marketing, eCommerce</td>
<td>5</td>
</tr>
<tr>
<td>SAP Systems Bolt-ons</td>
<td>5</td>
</tr>
<tr>
<td>Finance &amp; Receivables</td>
<td>4</td>
</tr>
<tr>
<td>Data Storage</td>
<td>4</td>
</tr>
<tr>
<td>Server Hosting &amp; Application Hosting</td>
<td>4</td>
</tr>
<tr>
<td>Business Systems Outside of SAP</td>
<td>2</td>
</tr>
<tr>
<td>Business Intelligence, Reporting, HANA</td>
<td>2</td>
</tr>
<tr>
<td>Laboratory Management</td>
<td>2</td>
</tr>
<tr>
<td>B2B and Front-End Applications</td>
<td>2</td>
</tr>
<tr>
<td>Web</td>
<td>2</td>
</tr>
<tr>
<td>Legal</td>
<td>1</td>
</tr>
<tr>
<td>Support</td>
<td>1</td>
</tr>
<tr>
<td>Technology &amp; Products</td>
<td>1</td>
</tr>
<tr>
<td>Testing</td>
<td>1</td>
</tr>
<tr>
<td>Document Management</td>
<td>1</td>
</tr>
<tr>
<td>Suppliers &amp; Supply Chain</td>
<td>1</td>
</tr>
<tr>
<td>Insurance</td>
<td>1</td>
</tr>
</tbody>
</table>

The adoption of cloud technology for peripheral non-ERP systems is strongly seen in the results. The most specific references included CRM & Salesforce.com (6), HR & learning (5), document management (1), laboratory management (2), insurance (1), and business systems outside of SAP (2). A number also noted that cloud use was growing primarily in non-critical, non-enterprise systems, smaller systems and new apps (5). Some noted growth in peripheral SAP systems bolt-ons (5).

The shift in IT infrastructure to the cloud was also mentioned by several respondents for data storage (4) and server hosting & application hosting (4).

In summary, these results indicate a large number of technology migration projects ahead for many operating companies. Test automation processes can play an essential role in helping to ensure that these projects are completed on time, with high quality, and in a way that is transparent to business users of cloud systems.
“Does your company have a “testing center of excellence” in place or have plans to start one?”

In our experience, the establishment of a testing center of excellence (tCEO) within an organization can reflect that organization’s maturity and progress in ensuring quality business process execution. It can mean that the organization has progressed from:

- Unit testing only to end-to-end business process testing
- Testing software for specific projects to testing business processes on an on-going basis
- Manual or lightly automated testing to highly automated testing
- Less focused testing to systematic impact analysis with targeted testing of changes
- Project-based budgeting to departmental budgeting for testing and quality assurance processes
- Less formal staff management to greater skills development and career pathing in testing and quality assurance as competencies

Because the tCOE is such a useful indicator of an organization’s progression along the maturity curve in testing and quality assurance, we added a survey question to assess industry status.

The numbers were gratifying and show good adoption of the concept. The number of companies with a center of excellence in place or with plans to start one was substantial – 41.6% of responses, or 251 out of 603 responses. About 25.7% have a tCOE in place already, and another 15.9% have plans to start one or are considering it.

In summary, these results show that many companies consider testing as important to maintain quality business process execution, and are developing and nurturing their staff’s skills in this area by establishing testing centers of excellence. This demonstrates that companies are increasingly viewing testing as an essential competency.
“Does your company plan to invest more in the areas of automated testing and software quality assurance in the next 12 months?”

Out of 594 responses, a large number - 204 companies (34.3%) - indicated that additional investment was planned in automated testing and software quality assurance in 2013. Only a quarter of companies indicated that no additional investment was planned in this area, and the balance did not know the status of planned investment.

Given the large fraction (41.1%) who were unable to comment on the question, we can assume that some of these firms also plan additional investment. This means that the actual number of firms planning additional spending in 2013 is probably higher than the 34% indicated by “yes” responses, which should be seen as a lower bound.

In any case, this represents a staggering amount of interest and activity in the area of test automation for 2013, and a continuation of the strong interest level seen in 2012. Certainly Worksoft can confirm the explosion of adoption in its top-ranked test automation software, with year over year business growth of approximately 30%, primarily among large global companies in both North America and Europe. In most cases companies are either (1) adopting automated testing for the first time while reducing the amount of manual testing and off-shoring through automation, or (2) already using some level of test automation and are replacing outdated legacy testing software with advanced automated testing solutions to achieve truly high levels of automation, cost savings, quality improvement, and staff efficiency.

If these rates of investment and adoption by the industry continue – and we see no factor that would tend to slow this trend – then in 5 years highly automated testing will likely be the industry standard approach to ensure quality in business process execution and in supporting software. Today highly automated testing is already seen as a best practice by many top performing firms.
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As Chief Technology Officer, Shoeb Javed is responsible for technology strategy, software development, quality assurance and customer support for all Worksoft solutions. He works with quality assurance and business leaders of some of the largest global Fortune 1000 corporations to help automate testing of complex packaged enterprise applications to speed up project timelines and improve operational efficiency.

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About Worksoft Inc.

Worksoft® is a leading global provider of test automation software for packaged enterprise applications. Companies use Worksoft solutions to innovate faster, shorten project timelines, reduce costs, and improve business process quality for SAP® and related software, including cloud, mobile, and portal technologies. Unlike legacy test automation systems, Worksoft is easy to use and supports business agility, performance testing, and end-to-end functional testing with high levels of automation – often exceeding 80% process automation. Worksoft customers include more than 150 premier companies and nearly half of the Fortune 100 in manufacturing, financial services, government, healthcare, retail and transportation sectors.

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