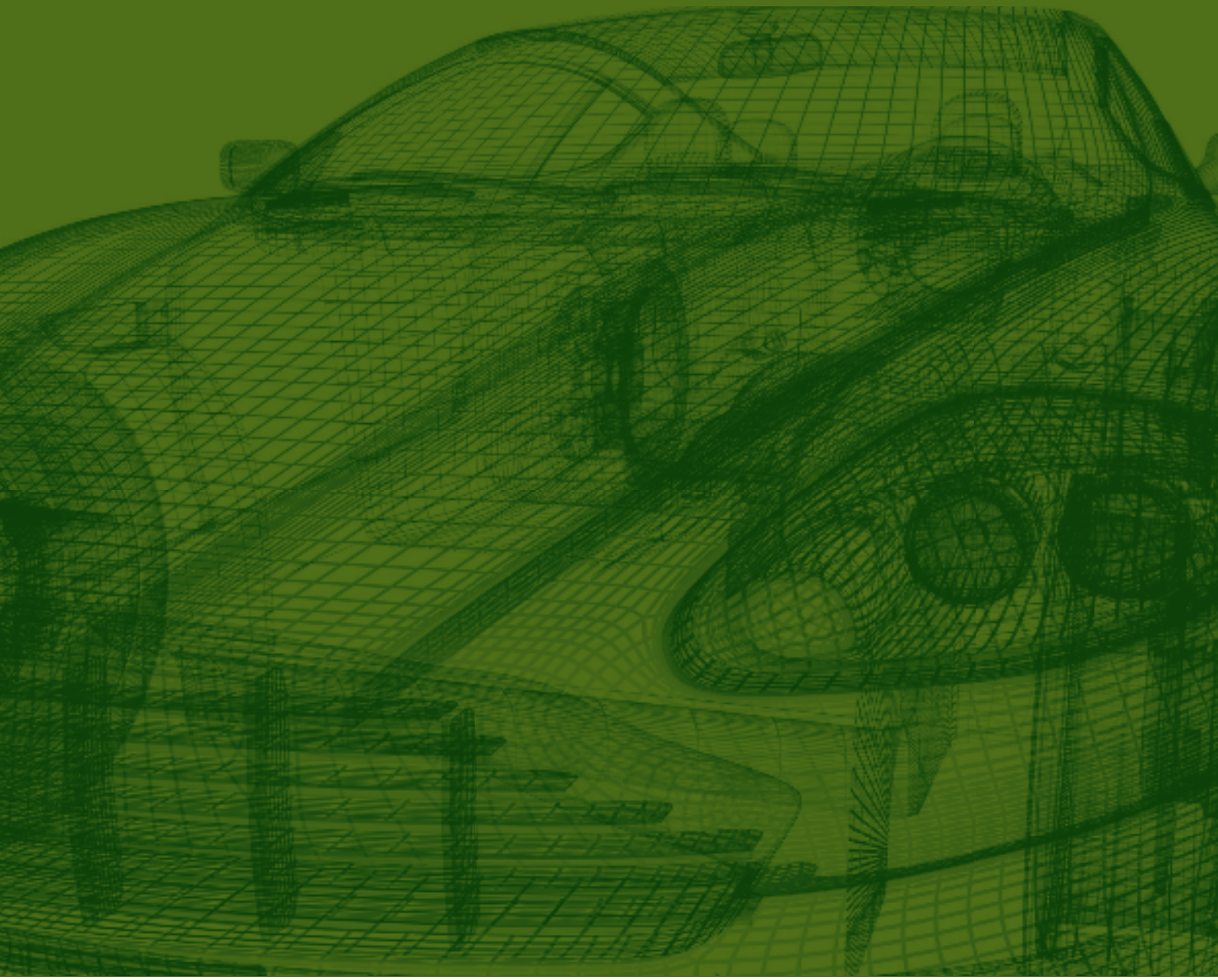
2010-11

world quality report



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Preface

Raf Howery
VP, Global Channels & Partners Executive, Capgemini

We are pleased to bring you the 2010-2011 edition of the World Quality Report. This report is designed to help companies understand the trends in application quality and testing across different geographies as well as industry sectors. The report also presents best practices to help quality assurance organizations learn how to do things better, quicker, and cheaper.

We believe that it is important to continually develop market-driven solutions that meet our clients' quality assurance demands. In this report, we monitor business, technology and economic trends in the software quality and testing space. This year, we added data on the direction of IT investments and application quality in a number of specific industries: Consumer Products and Retail, Distribution and Logistics, Financial Services, Public Sector, High Tech and Telecommunications. We hope you find this report to be valuable and that you gain insights into an increasingly important aspect of the Application Lifecycle Management process. In our next edition, we intend to increase the statistical sample and create an associated tool that allows companies to benchmark themselves against their peers in the same market segment and other segments who may be more mature, thus improving the learning process.

We want to thank HP for its continued collaboration and for helping to make this study possible. Capgemini Group and HP share a common culture, so it is natural to combine the depth and breadth of our business intellectual property with the strength of HP in the testing market. Introducing the World Quality Report is just one of many collaboration points between Capgemini Group and HP in our ongoing efforts to provide guidance to our clients.

Jonathan Rende
General Manager & VP, Application Business, HP Software & Solutions

HP's Application Lifecycle Management business has long been a thought and market leader in the Quality Management sector. Our continued investment in quality management, requirements management, service testing and agile process support is based upon a deep understanding of industry shifts and trends. We are very proud to team with Capgemini and contribute to the new World Quality Report.

We believe that the role of quality is increasing in status and business relevance. It is no longer just a gate in the software development process. It is now, arguably, the top ingredient for business success for an IT organization, that begins far upstream in demand and requirements management and extends far downstream into production. There is no doubt that quality is a top CIO priority. Quality organizations now get involved earlier, have greater decision making ability and have far more business responsibility when representing the end user community.

Profound changes are driving how applications are built and delivered. Mega trends such as process and organizational shifts driven by the agile movement and cloud computing are increasing in visibility and implementation. While the worldwide business climate is showing some signs of improvement, I see that more organizations are leveraging the uncertain economy to transform their IT application portfolios in the best way possible.

I want to again thank Capgemini for the invitation to participate in the 2nd edition of this report. We are proud to co-sponsor this project and see how the above changes will continue to drive positive change in the application industry. Most importantly, I'm excited about how organizations can now find better ways to deliver their applications.

Foreword by the Authors •

Murat Aksu
Global Head of HP Software Alliance, Capgemini

Charlie Li
VP, Global Testing Services, North America Leader, Capgemini

Welcome to the 2010-2011 edition of the World Quality Report

2010 has brought many changes. The economies around the world are slowly on their way to recovery, IT spending is on the rise, and companies are starting to reinvest in modernizing their applications while software quality is once again moving into the spotlight.

What the recessionary years have taught us is that often the only way to thrive in a difficult economic climate is to find ways to cut operating costs, while increasing speed and efficiency. To do that, companies need IT systems and organizations that can adapt quickly to changing market conditions, perform without interruption and provide security and data integrity that's expected in today's business world.

With a combined 40 years of experience in Quality Assurance (QA), Capgemini and Sogeti are often asked to help companies develop and implement quality processes that would help ensure their IT applications' reliability and stability. Since 2008, Capgemini Group and HP – recognized leaders in application quality – began conducting a formal global survey and publishing a yearly World Quality Report to help clients stay on top of the latest trends in application quality, methodologies, tools and processes.

In this year's report, we revisit quality trends and approaches and take a closer look at related industry-specific issues and challenges. We also examine new trends in application delivery – such as using agile methodologies and testing cloud-based applications – and explore the effects that these new approaches are having on QA practices and techniques.

We are committed to continuing this tradition for years to come – giving our readers a closer look at software quality tools, the state of quality, changes in QA organizations, outsourcing and the recent economic effects in the testing space. We would like to thank all IT professionals who took the time to complete the survey and contribute to this report. We would also like to recognize contributors from HP and Capgemini Group for their immense support and dedication to this research.

We hope you find this report engaging and beneficial to your company's continued success.

Executive Summary •

The 2010-2011 World Quality Report is a result of ongoing collaboration between Capgemini Group and HP Software & Solutions. It presents findings from the 2010 global survey of CXOs, IT directors, quality assurance managers and engineers, and examines the state of application quality and testing practices across different industries and geographies.

Each year, this report looks at current trends in software quality and examines emerging tendencies that may affect the future of testing. Survey respondents are asked to evaluate the level of investment in Application Lifecycle Management (ALM) solutions in their organizations, rate the return on investment for these solutions, answer questions about their testing practices, and assess the general levels of application complexity. This year, the survey also included specific questions about the adoption of agile delivery and testing methods, and application virtualization.

Key Findings

The research revealed a number of key findings:

- Although in 2009 most companies had to reduce their IT spending, the vast majority of organizations (71%) are still investing in new application development projects. IT investments are shifting from a daily, operational focus towards building new applications that bring competitive advantage for the business.
- Developing new IT systems with limited resources means that both developers and testers experience an increased workload. Half of the survey respondents indicate that resource cuts and heavier project loads have forced their project teams to take on more work. Increased pressure mandates the need for greater efficiency, more consistent QA methodology and better reuse of automated testing assets.
- Having a defined application lifecycle methodology is no longer viewed as a barrier for agility. More than 70% of all surveyed organizations admit to following a specific ALM methodology, and 82% of respondents indicate that testing processes are being consistently followed in half or more of their IT projects proving that agile methodology and testing processes are not mutually exclusive.
- QA organizations increasingly require well-rounded resource skill sets. While resources with strong testing skills and business knowledge are always important, an increasing number of teams prefer to bring on board testers who also have a good understanding of development practices and methodologies. Close to 72% of all surveyed IT professionals say that testers with development backgrounds perform their tasks better than those without the technical expertise. This shows a trend for greater convergence between the business, development and QA skill sets, and an increasing need for testers to take on a more active role in both the business requirement and development processes.
- This is especially true for agile organizations. Agile is requiring the teams to work with a greater degree of collaboration. QA can ensure that quality becomes part of the application lifecycle by providing the right skill set – technical knowledge of the development process and strong business process expertise.
- Agile delivery methods continue gaining popularity. Over 60% of surveyed companies leverage agile, although most are still experimenting, utilizing agile only in a portion of new IT projects. This approach allows organizations to adopt agile gradually. With this approach, they can identify development and testing practices that work well for them – rather than switching a large number of projects to agile without considering the implications on their organizational structure, available skill sets and existing practices.
- Organizations that have adopted agile see a significant improvement in time-to-market and application quality, although there are still challenges – specifically in facilitating communication and collaboration between teams.
- Communication is also noted as the number one barrier preventing agile organizations from outsourcing application delivery. However, the trend for outsourcing is not affected by an organization's development methods. Nearly 50% of organizations outsource application development and testing whether they use agile or utilize more traditional methods. Additionally, over half of organizations are planning to increase the use of offshore resources in the coming year. The biggest growth is seen in Europe, where quality management outsourcing is outpacing other regions.
- Along with improved agility in software delivery, IT organizations are aiming to gain agility in their applications and infrastructure. Virtualization enables companies to improve capacity planning and save significant resources on hardware and datacenter maintenance. Nearly three quarters of all respondents are starting to leverage deployment of some

of their applications on the cloud, with only 8% experiencing problems that caused them to roll back to physical infrastructure.

- Cost reduction is the number one reason for companies to move their applications to the cloud, followed by increased agility. However, many companies are still unclear how to leverage cloud services for application testing. Cloud infrastructure could offer many advantages in quickly building up test environments, hosting testing tools on the cloud, or generating load for performance testing. We believe that in the coming years, more companies will begin to realize these benefits, and we will see an even greater adoption of cloud services.

IT organizations are aiming to gain agility in their applications and infrastructure.

Introduction

To keep pace with current application quality trends and technologies, Capgemini Group is surveying thousands of IT professionals from around the world on an annual basis to assess the current state of application quality, how companies perceive their application quality and how quality is affected across different industries.

This year's World Quality Report examines the effects of the recent economic downturn on companies' IT investments, identifies emerging trends in using test automation tools and testing methodologies, looks at the changing profile of a QA tester and analyzes current trends in QA outsourcing. The report also explores new technologies that have a direct impact on quality – agile application delivery and cloud computing. The 2010-2011 report also includes a detailed profile of the state of IT as it relates to quality in six specific industries:

- Consumer Products and Retail
- Distribution and Logistics
- Financial Services
- Public Sector
- High Tech
- Telecommunications

We hope that the data points provided by the report – together with our experts' opinions – will help you gain a better understanding of the current state of application quality and the trends that affect it.

testing tools & technology

Application complexity is increasing, but quality is also on the rise

Today's IT applications support increasingly complex business processes. Not surprisingly, applications themselves are becoming more intricate and inter-connected. In our survey, an overwhelming majority (88%) of survey respondents agree that software systems have increased in complexity. In the past, organizations have been able to deal with increased workloads by adding resources to their quality management teams, but with reduced IT spending, companies are looking at alternate ways of keeping pace with growing complexity – such as streamlining the quality process, increasing the degree of test automation and outsourcing testing activities.

However, despite poor economic conditions and limited QA resources, IT organizations still seem to see a steady increase in software quality over the last two years. Over 80% of respondents say that quality is actually improving. We attribute this to the fact that a growing number of organizations are treating application quality as a formal process – incorporating quality methodology into their application lifecycle. Nearly three quarters of respondents adhere to a defined QA methodology that they follow in the majority of their IT projects. We see this as a sign that application quality will continue to improve and keep up with the increased complexity of business applications.

Businesses use more test automation, but struggle to realize full ROI on their solutions

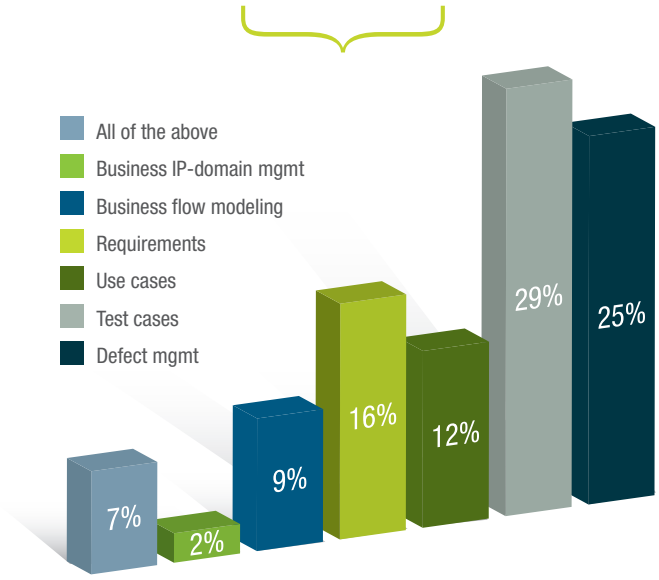
The use of test automation technologies is on the rise. Companies are increasing their investments in quality solutions and are becoming more skilled at using them. Our survey found that nearly half of all businesses reuse 50% or more of their testing assets, ultimately leading to increased testing efficiency, higher levels of test case automation and shorter testing cycles.

However, a more detailed analysis reveals that test automation technologies are more widely leveraged in the later stages of the application lifecycle, such as test case management and defect tracking, and not as commonly used in the earlier stages, such as requirements gathering, use cases, and business flow modeling. (See Figure 1.)

Defect tracking and test management represent more traditional QA tasks, and automation tools for these phases have been available for many years. Solutions for the earlier stages of the ALM are still relatively new on the market and represent an innovative approach to application delivery – involving QA in all stages of the lifecycle. A growing number of companies recognize that the cost of fixing problems late in the development phase is much higher than the cost of preventing problems by incorporating quality into requirements and use cases. Yet, they are still slow to adopt quality solutions for the entire lifecycle – largely due to their inability to accurately quantify Return on Investment (ROI) on the solutions that they already own.

Q: What components of your organization's ALM process leverage automation technology?

Figure 1: Companies are slower to adopt automation technologies for earlier stages in the application lifecycle.

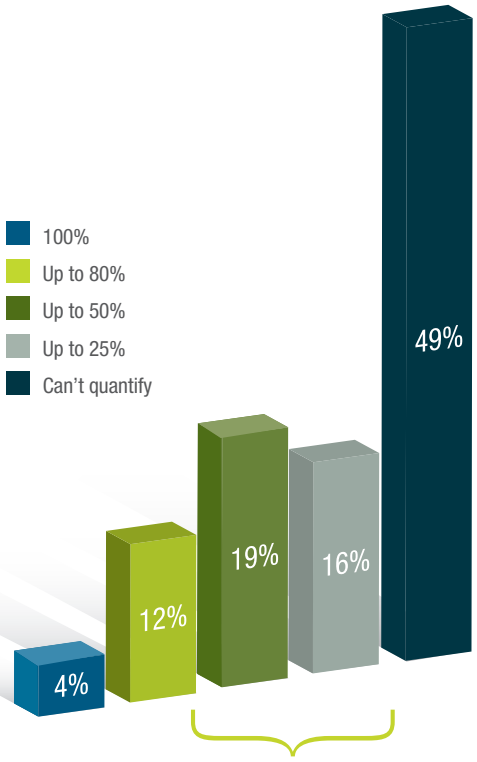


Companies are increasing their investments in quality solutions and are becoming more skilled at using them

Nearly half of all survey respondents are unclear as to the extent to which purchased ALM tools' licenses are being leveraged and whether they are generating the expected ROI. (See Figure 2.) Across all regions, only 4% of IT professionals agree that all of their ALM investments are fully paying off, and only slightly more than a third of respondents said that half or more of their solutions have been fully implemented and are helping to improve application quality. QA organizations need to focus on increasing the adoption rates of their purchased technologies. This will help demonstrate positive ROI and measurably improve their ability to secure funding for additional investments in automation technologies, especially for the much-needed solutions in the earlier stages of the ALM. Establishing formalized measurement programs will enable QA organizations to track relevant metrics driven by business objectives. This will provide data and facts in a business context to demonstrate the value of investments in application quality.

Not enough resources are invested in tool adoption

One of the main reasons companies fail to fully leverage their test automation solutions has been the lack of planning and inadequate funding needed to deliver key services around the deployment of automation tools, training and mentoring of resources. (See Figure 3.)

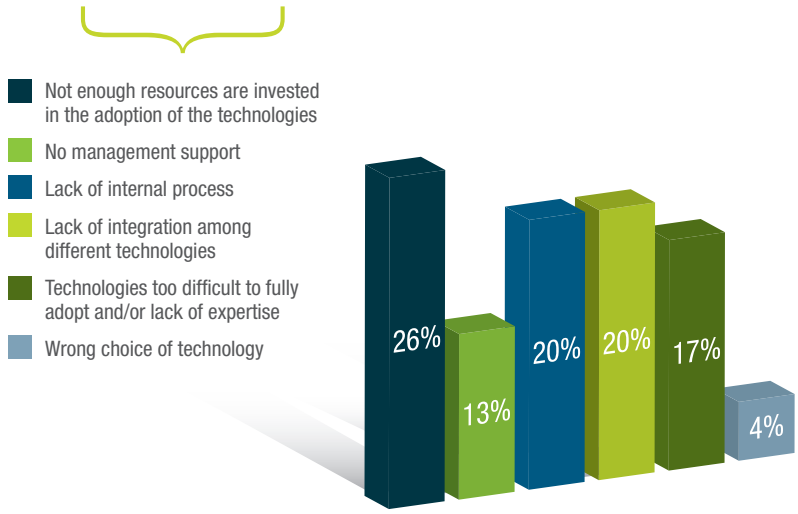


Q: What percentage of your purchased ALM tools' licenses are being used and generating the expected ROI?

Figure 2: Only a small number of companies believe that all of their ALM tools' investments are generating expected ROI. Almost half cannot quantify the return on investment.

Q: What are the biggest obstacles that prevent you from fully leveraging 100% of your ALM tool investments?

Figure 3: Limited investment in adoption and lack of internal processes are leading the list of obstacles that prevent companies from fully leveraging their investments in ALM tools.



In order to cut costs at the time of technology acquisition, purchasing departments often veto service-line items that would help with the planning and successful implementation of enterprise-level technologies. In some cases, the organization may purchase services for a successful initial implementation, but underfund ongoing maintenance and mentoring, thereby undercutting the future success of the investment. In other cases, turnover in resources and project champions can cause automation efforts to slow down or completely stall, with QA teams reverting back to creating manual test cases using word processing applications. In extreme circumstances, QA teams diligently create thousands of automated scripts without a clear strategic plan, only to find that their efforts go to waste due to drastic changes in the platforms and the functionality of applications under test. It is important to note that simply learning how to use the automation tool is not enough. To successfully implement a test automation project, it is essential to have a deep understanding of automation strategies, frameworks and tools. In addition, having an experienced champion mentoring the project will increase the organization's chances of meeting their quality objectives. In practice, it takes at least three to five years of direct, hands-on experience to develop automation skills that resemble a champion.

In order to fully leverage their investment in test automation, enterprises need to look at the big picture when acquiring and deploying tools. A well-defined implementation, integration and adoption strategy with qualified professional services and training for internal staff can help push a technology investment to exceed expected ROI and move the organization closer towards their commitment to quality. QA teams need to learn to look at IT investments in the same way business investments are considered and implemented.

Companies believe in boosting investment in automation technologies

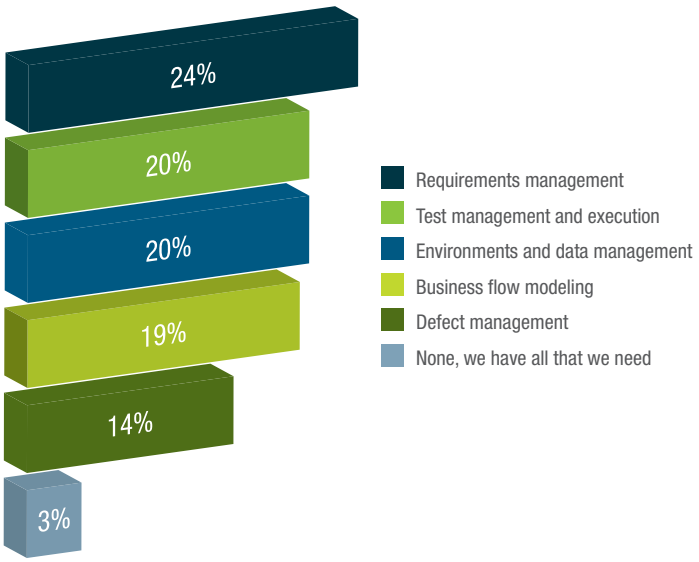
Survey results indicate that new and increased investment needs to be considered for automation throughout ALM, particularly for requirements visualization, test environments, data management and business modeling. Investment in these areas is expected to generate higher quality applications, reduce rework, and decrease the cost of testing and defect management later in the application lifecycle. (See Figure 4.)

1. Requirements visualization and business flow modeling

Requirements gathering and management have traditionally been a problematic area for the quality process. Most of the requirements documents that are generated by the business analyst community have been fairly complex and voluminous. The fact that most requirements documents do not accurately correlate to the actual, testable business processes limits the ability of QA teams to extensively utilize them. If QA is unable to understand the requirements, they cannot effectively translate them into corresponding test scripts. The complexity of interpreting and tracing requirements to test scripts has undermined the establishment of repeatable testing processes. This has resulted in ad-hoc testing rather than the requirements-based validation that is the industry best practice.

Q: Where would you like to see additional technological investments made in ALM automation?

Figure 4: Companies see requirements management, test management and environments and data management as priority areas for investment.



There are new technology vendors, such as Blueprint Systems, that are attempting to bridge the gap between the business analyst and QA teams by transforming requirements from plain text into logical business flows that are supported by visualization, prototyping and simulation. In some cases, the requirements visualization has been tightly linked to QA processes and can automatically generate use cases and test scripts to reduce upfront testing cost and time. Time and effort should be spent by the business in evaluating where visualizations will add the most value.

2. Environments and data management
Test environments and data management are becoming a growing concern for QA teams. As application complexity grows, it is becoming increasingly difficult for QA teams to create testing environments that mimic the real-life infrastructure and environment of production applications. In some cases, government regulations and privacy concerns restrict the use of production data in testing environments. Technologies such as test environment virtualization and data masking are increasingly becoming a necessity for QA teams to manage these situations.

IT organizations are more consistently using common methodology, but their testing practices are still mostly proprietary and not based on industry standards

The growth in automation technologies is at least partially fueled by the increase in adoption of consistent testing methodologies. As organizations mature, they realize that ad-hoc testing does not provide the advantage of reusing testing assets, standardizing on common metrics or having a repeatable quality process. This year's survey indicates that as many as 72% of IT organizations follow a defined ALM methodology both in their development process and in their testing activities. The number varies slightly between regions, with the lowest number of ALM followers in Europe (65%) and the highest in Asia (78%).

However, when asked to choose from a list of industry-standard methodologies, nearly three quarters of respondents say that they do not follow Test Management Approach (TMap®), Test Maturity Model Integrated (TMMI) or other common standards. Instead, their organizations develop and document their own best practices that are followed in the majority of development and testing projects. While having a common methodology is a positive trend, it is often open to interpretation. Different groups in the organization may adopt their own "versions" of the standard practice, and as a result, the company as a whole is not fully realizing the benefits of standardization, economies of scale, common metrics, unified reporting and asset reusability. This is especially true for large enterprises that give their divisions and subsidiaries relative autonomy in choosing their testing tools and practices. Also, many of these homegrown methods are usually development-focused and do not specifically address testing. Implementing a standard testing methodology such as TMap® or TMMI requires a company-wide commitment. Only when every IT group within the company adopts the standard practices can the company achieve the quality improvement benefits offered by the methodology. Having a homegrown policy is still significantly better than not following any formal QA methods, but it may not afford companies the full benefits and efficiencies offered by a more standard, widely accepted methodology.

testing organization & tester profile

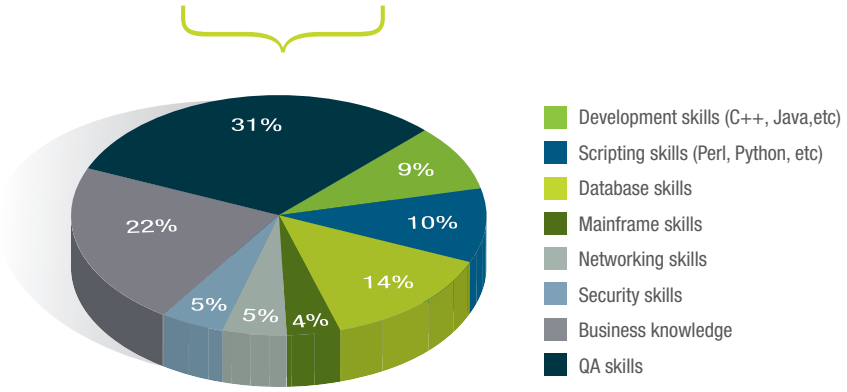
Business is looking for a new tester profile

Historically, testers have been former developers who have switched careers to QA or business subject-matter experts wearing multiple hats. Today, the profile of a tester is changing rapidly. Due to the growing integration of IT and company-specific business goals, companies prefer testers who have both strong technical skills and relevant domain and business knowledge. In addition to being knowledgeable about automation technologies, testers need to be able to understand business requirements and create test validation for specific business needs. Organizations are also looking for testers who can provide actionable analysis to developers for fast resolution of defects.

More than two thirds of respondents (72%) say that their testers have several years of business domain experience and an additional 18% indicate that their testers have full domain expertise. Business knowledge is the second most valuable asset identified for a QA tester following QA skills. In-depth knowledge of development processes and programming languages came fifth in the survey behind database and scripting skills. (See Figure 5.)

Q: When hiring testers, which of the following skills are most important to you?

Figure 5: Companies value business domain knowledge in testers above development skills.



This clearly suggests that future testers must become better rounded in both business domain and technical skills. QA is becoming a more professional career where organizations are expecting a smaller, but more skilled and highly developed workforce steeped in business knowledge. As application complexity increases, time-to-market challenges will require testers to have domain, application and technology knowledge in order to quickly dissect problems and provide fast and accurate information to development teams.

Along with tester profiles, the nature of a test organization is also rapidly evolving. Twenty years ago, most testers were part of the overall development group and often reported to developers. This limited their ability to be independent evaluators as the testing teams were under the influence of developers. In the late 1990s and early 2000s as testing started to become an accepted professional career, we started to see independent test organizations co-exist with development groups. In some instances, testing organizations even started to report to VPs of Operations in order to bridge the gap between pre-production and production management. With the advent of agile delivery, we expect to see an increased trend that moves away from clearly defined development and testing organizations to a project team concept that combines the best talents from development, testing and business teams, working together towards a common business goal.

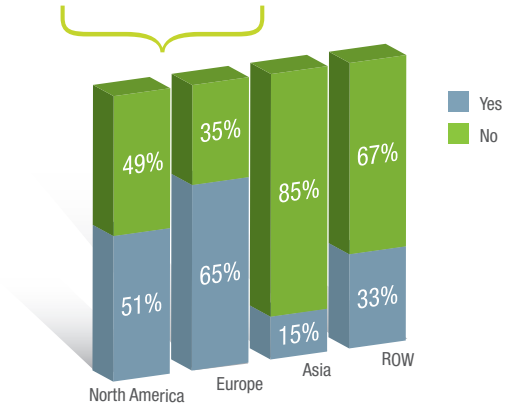
outsourcing trends

Outsourcing continues to play a key role in quality management and, by all indications, this trend will increase over the next few years. More companies are choosing to focus on their core business and outsource functions like QA to third-party vendors.

Europe is leading the way in outsourcing testing projects with 65% of European respondents confirming their use of offshore testing. In Asia however, an overwhelming 85% of respondents say that they do not currently use outsourcing and are instead relying on internal resources for their testing activities. This low level of interest in outsourcing is most likely attributed to the fact that labor costs in Asia are still significantly lower than in Europe or in North America. (See Figure 6.)

Q: Does your organization use outsourced resources for testing?

Figure 6: Europe leads the way in QA outsourcing trend, while Asia shows the lowest percentage – possibly because of lower labor costs in the region.



Several key trends are emerging in outsourcing:

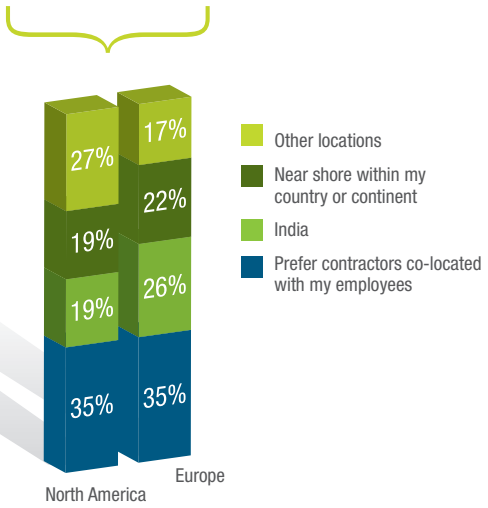
1. QA outsourcing is on the rise, but companies prefer domestic or near-shore vendors

Of the respondents who outsource, over half say that they are increasing the use of offshore QA resources, with another 29% planning to keep their outsourcing at current levels. Only 19% of respondents are planning to reduce the number of outsourced testing projects. Not surprisingly, the largest number of responses for reducing outsourcing investment comes from Asia and the smallest from Europe. In fact, 41% of European respondents say that their organizations are increasing the use of outsourced resources for testing, compared to 30% in North America.

Over a third of European companies (35%) prefer their QA vendors to be co-located with their company employees, 26% prefer to outsource to India and 22% to near-shore locations. (See Figure 7.) Most European countries – such as the United Kingdom (UK) – have favorable laws that allow them to use affordable long-term local or near-shore contractors. Many of the organizations that we researched have QA organizations completely staffed by long-term contractors (with 20 continuous years or more in some cases) and niche local consultants. This would not be possible in the United States (US), where independent contractors are traditionally more expensive than outsourcing locations. Furthermore, large enterprise accounts in the US have internal policies that limit the amount of time a resource can be employed as a contractor before the contract must be converted into a full-time employee.

Q: What would be your ideal location to outsource your testing activities?

Figure 7: Companies prefer to have their QA providers close to their employees, followed by outsourcing to India and near-shore locations.



Naturally, when QA service providers are co-located with the company's employees or are close in language and culture, the flow of information and communication is much easier. The exception to this trend is outsourcing to India, but we believe it can be explained by India's leadership and experience in providing QA services, cost advantages and developed infrastructure that supports communication and collaboration.

2. Outsourced resources are becoming more skilled and business-oriented

Similar to the trend that we saw in internal QA hiring, companies are beginning to place a higher premium on business and domain knowledge when selecting their outsourced service providers. One of the biggest challenges is that vendors do not provide enough skilled resources with the business and domain knowledge of the client. Only 14% of all survey respondents say that their outsourced resources possess relevant domain and business knowledge.

In the earlier phases of outsourcing, companies were seeking cheaper resources to augment their capabilities at lower cost. With rates at overseas outsourcing centers increasing, companies in North America and Europe are re-evaluating profiles. In the near future, companies located in the Western hemisphere will require outsourcing resources to provide domain intellectual property (IP) knowledge, industry-specific experience and highly technical testing skill sets that are backed by robust best practices. This shift in demand has resulted in a rise of many vertical-specific service providers and has forced other service providers to further organize their solutions into verticals.

Over a third of European companies prefer their QA vendors to be co-located with their company employees.

3. Automation could reduce the number of outsourced resources

Companies in Europe and North America that use outsourcing without proper governance often find that their outsourced QA teams grow uncontrollably large as a result of having to add more people to solve quality problems. This type of unchecked growth, coupled with rising costs of offshore testing services, threatens to negate any cost-saving benefits achieved by outsourcing. In the survey, most respondents say that their organizations can reduce the number of outsourced testing resources by increasing their levels of automation. With more QA automation and a higher-skilled labor force, companies would feel comfortable reducing the size of their outsourced QA teams and projects.

4. New value-added services demanded from outsourcing partners

There is a divide between organizations that are looking to continue business-as-usual by simply augmenting their QA teams with offshore resources and organizations that are looking for more value-added services from their outsourcing vendors. The more mature organizations are now looking to gain more specialized services, such as industry-specific quality solutions with pre-built requirements, test cases or automation from outsourcing vendors. On average, 45% of respondents say that they would increase outsourced testing resources if they could have more value-add from vendors. A further 21% say that, while they would not increase outsourced resources, they would still be interested in vendors' solutions and IP. Similarly, 36% of respondents said that they would use outsourced testing services if they offered expertise and methodology in testing-specific applications such as SAP. This clearly indicates that in order to continue the successful relationship with their clients, outsourcing vendors need to offer more specialized, value-added services, and not just be an extension of the client's workforce.

from agile development to agile delivery

By Ken Brennock, Manager, Agile and Automation Practice, Sogeti, and Brad Hipps, Senior Manager, Applications Solution Marketing, HP

Agile development methodology took the IT world by storm when it first emerged nearly 10 years ago. It was a dream-come-true for developers who no longer had to spend weeks gathering project documentation, and instead could focus on what they liked best, writing code. However, most importantly, it held a big promise for business and IT executives who were tired of taking on huge projects only to see them fail, run over budget, miss deadlines and deliver little or no business results. Companies big and small began turning from waterfall and other traditional development methods to agile, hoping to improve business responsiveness, make their applications more adaptable to changing market conditions and enhance the quality of their IT systems.

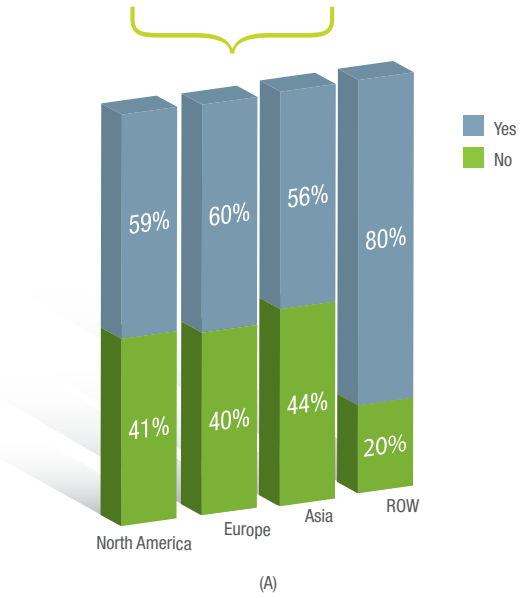
Nevertheless, the road to agile wasn't always easy. Some companies tried to switch all their major development projects to agile only to find out that their IT and QA organizations did not have the required skill set to support the new development methods. Others, concluding that faster development means that formal quality management processes are no longer needed, attempted to assign all QA functions to Research & Development (R&D) engineers, negatively impacting the quality of the finished product. Still others tried to force agile on large, globally distributed teams, without taking into consideration the high degree of communication and collaboration required to work in an agile environment.

Despite many challenges, agile is here to stay, and it is gaining popularity. Our survey and other industry studies indicate that over 60% of all companies have either already adopted agile methods or they are planning to do so in the near future. Companies of all sizes, across all verticals and geographies, are adopting agile for both new and existing projects to give a competitive edge to their business. (See Figure 8.)

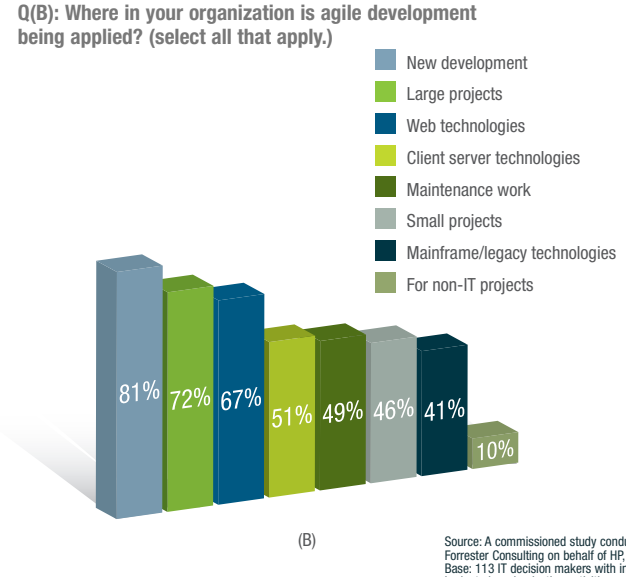
There is also a correlation between the types of IT projects that companies continue to invest in and the growing popularity of agile delivery methods. Most companies are focusing their IT investments on projects that generate immediate ROI, and agile is ideally suited to deliver functional applications fast and with predictable quality.

Q(A): Do you leverage agile development/delivery methods in your company's ALM?

Figure 8: Companies in all industries leverage agile methods across projects and technologies.



Q(B): Where in your organization is agile development being applied? (select all that apply.)



Source: A commissioned study conducted by Forrester Consulting on behalf of HP, April 2010. Base: 113 IT decision makers with insight into budgeted modernization activities currently using agile development approach.

Agile can help significantly improve application quality, productivity and time-to-market, but it is not a cure-all remedy.

Best practices adopted by successful agile companies include:

1. Set realistic expectations
Agile can help significantly improve application quality, productivity and time-to-market, but it is not a cure-all remedy. Perhaps the most significant benefit of agile is that it provides a much more realistic measure of progress. Instead of gauging the effort, developers are measuring true progress, which brings them closer to the business and makes them more aligned with the stakeholders' expectations.

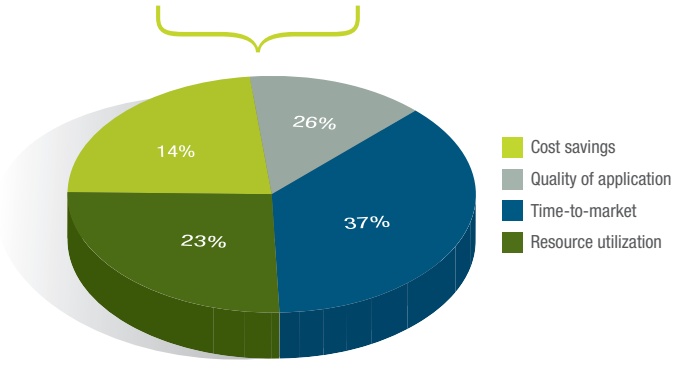
Survey respondents say that time-to-market is the greatest benefit that their organizations realized by adopting agile. Agile is helping IT teams deliver applications on time and within budget while minimizing rework due to its iterative and predictable nature, greater productivity and faster reaction to change.

2. Do not ignore quality
Many companies claim that they are moving away from waterfall because they are discovering issues too late in the application development process when it is too costly to do anything about them. Unfortunately when they move to agile, they find themselves falling into the same routine – develop in fast sprints, but still test at the end of an iteration, or even after several iterations.

Quality should be part of every step of any agile development process. Each sprint should be composed of some amount of development and testing. This is the only way to identify issues and project risks earlier in the lifecycle. With the right approach, agile organizations can achieve significant improvements in quality. In fact, surveyed companies perceive quality improvements as the second biggest benefit of agile – behind only time-to-market advancement. (See Figure 9.)

Q: In which areas has your organization seen an improvement as a result of moving to an agile delivery method?

Figure 9: Agile yields significant improvements for IT organizations.



3. Find the right skill set
Agile brings development and testing functions closer together, but it does not automatically turn developers into good testers, or make testers more familiar with the development process. Organizations need to take a closer look at the skill set required by the QA team to effectively support agile methods.

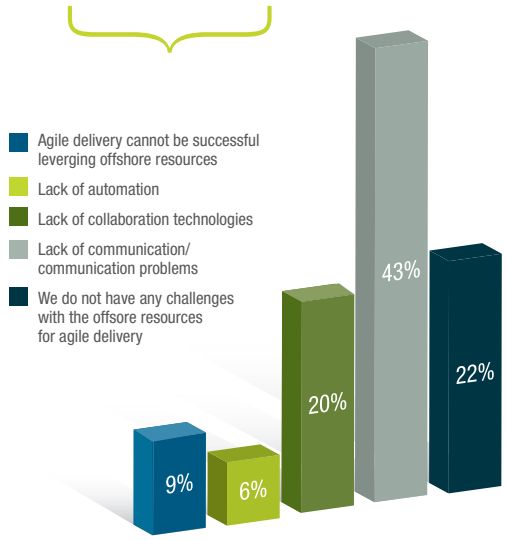
Agile testers need to be more versatile than traditional testers. On the one hand, they must be more technical, more familiar with development practices, and comfortable with using non-traditional test automation tools to validate Graphical User Interface (GUI)-less applications. On the other hand, they need to be close to the business to understand the requirements, work with end-users throughout the project, react quickly to change and tie application quality directly to business value. Because agile teams are typically small (six to twelve people) or a collection of smaller teams ("scrum of scrums"), an agile tester can be compared to someone working in a small company where everyone wears multiple hats. With the right skill set and a strong understanding of all aspects of the business, development and testing, QA can truly make agile an effective and successful method for the company.

4. Emphasize communication
Some agile "purists" may say that companies cannot have agile when they have distributed teams. In contrast, the survey results confirm that the reality of today's business is distributed teams, and many of them are successfully adopting agile methods. Nearly half (46%) of all respondents leverage offshore resources in their agile delivery. These results clearly indicate that it is possible to be distributed and be agile. The key is to stay connected. The two biggest challenges when working on agile projects with outsourced partners are poor communication and lack of mutually accepted collaboration technologies. (See Figure 10.) It is our experience that in offshore situations, companies must emphasize the management of cultural and language differences since they often directly contribute to communication problems.

Through proper work planning, team structure, central asset repositories and open communication, distributed teams can achieve agile success.

Q: What is the biggest challenge working with offshore resources for agile delivery?

Figure 10: The biggest challenge when working with outsourced partners is lack of communication and lack of collaboration technologies.



5. Achieve speed through automation

Agile thrives on efficiency. Agile delivery teams need to make their processes as efficient as possible, and this means increasing the leverage of automation frameworks and test optimization techniques such as risk-based testing and orthogonal arrays. Developing and managing requirements, generating test data, storing project assets, building and running tests – all tasks that are run routinely – cannot stay manual without slowing down the process and creating unnecessary burden on the teams. Technologies and techniques that are considered "nice to haves" in the traditional application lifecycle have become necessary enablers of agile success.

Traditionally, test automation in an agile environment was difficult due to lack of application UI. Most available automation tools required a GUI to start building test components and scripts. However, the emergence of the new generation of test automation solutions allows testers to begin automating much earlier in the process, without the need for the UI to be completed. This significantly improves the speed, quality and consistency of agile testing and contributes directly to higher application quality.

6. Organizations may need to find their own, unique form of agile

Agile can be more complicated than traditional development methods, and the complexity is not only about writing code and testing at a faster pace. Agile changes the very way IT interacts with the business. Adopting agile means finding the balance between speed and quality, responsiveness and predictability, embracing change and economies of scale, minimal documentation and accurate reporting.

Many organizations find success in taking the best of traditional methodologies and applying them to their agile projects, creating a unique hybrid model that works for them. Perhaps some testers are more used to gathering requirements than user stories, or specific project teams need more granular reporting to satisfy regulatory compliance. Companies can find an agile method that's right for them. The main principles of agile – building in small iterations, hands-on communication with the stakeholders, rigorous testing and receptiveness to change – are going to continue to work, even if teams add elements from other methods. The end result will be higher quality applications and greater business value.

For the testing organization, agile represents both an opportunity and a challenge. The majority of surveyed organizations (67%) are not currently using agile-specific testing methods to support agile application delivery, which suggests that the role of the agile tester is still not well defined. For years, testers have been trying to ensure that application quality be considered earlier in the lifecycle. With agile, QA can help make it happen by providing the right skill set, including technical knowledge of the development process and strong business process expertise.

Agile is requiring teams to work with a greater degree of collaboration. It collapses the silos making the entire team feel ownership of the product. Testers no longer have the back-seat role where they are forced to wait until the application is delivered to them. They are actively engaged from beginning to end. Agile is a different way of working. It requires a new level of competency and commitment from the QA organization, because it is not agile development, but rather agile delivery that ultimately makes projects successful.

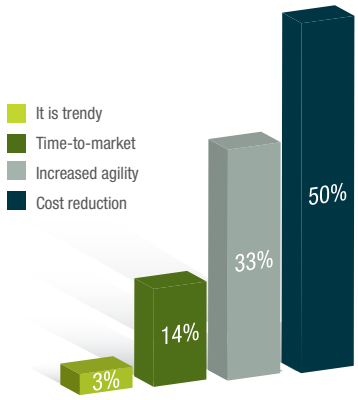
deploying applications on the cloud

By Dennis Corning, Senior Manager, Product Marketing - BTO Virtualization, HP

Historically, IT has planned for application capacity by allocating a dedicated physical server for each application or project. The general rule was to run each server at about 50% capacity to allow for planned and unplanned spikes in activity without degrading performance. In such environments, datacenters were expanding rapidly, and IT managers did not have the ability to easily reduce the application footprint and use existing capacity in a more efficient manner. In reality, most servers are only utilized at about a 15% rate, and IT doesn't have an accurate way to predict actual capacity needs.

To minimize capital expenditures and gain better control of their IT resources, companies are beginning to take advantage of the delivery model known as cloud computing. In cloud computing, applications and information are provisioned on-demand as a shared resource. Cloud architecture can be set up as a "public" cloud – with services dynamically delivered from a third-party provider hosted outside of the firewall; "private" cloud – where a cloud-like architecture can be set up over the company's private network (inside the firewall); or a hybrid model utilizing a combination of internal and external providers.

Public and hybrid cloud customers typically pay for capacity and applications on-demand, enabling them to streamline their IT architecture and reduce operational expenses such as datacenter maintenance and power consumption. Our survey found that IT professionals who deploy their applications on the cloud view cost reduction as the number one benefit of switching from the physical infrastructure. This is followed by increased agility – giving IT the flexibility to move the workloads around and add capacity as needed. (See Figure 11.)



Q: If you use cloud, what is your company's top reason?

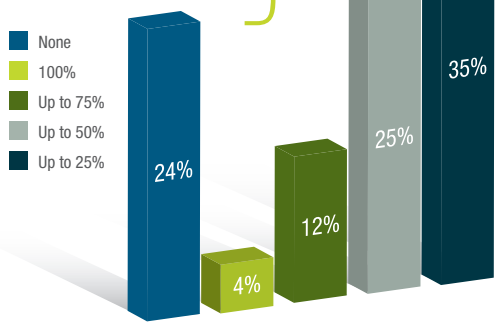
Figure 11: Nearly half of IT professionals deploy applications on the cloud to save costs.

If a company is planning to run a big promotion or introduce a new, highly anticipated product, they must plan for increased traffic to their web site and higher order volumes coming through their IT systems. Traditionally, IT would have had to purchase additional server capacity and deploy it in their datacenter, requiring added staff and extra maintenance expenses. Using the cloud architecture, IT managers are now able to quickly replicate their application environment on the cloud and have the capacity they need on-demand. The same holds true for applications that are only used several days out of the month – such as accounting or financial systems. Application performance during those critical times is essential, but for the rest of the month it may remain virtually idle, so capacity can be turned off or re-allocated elsewhere.

Companies are still cautious about moving all of their mission-critical applications to the cloud. In our survey, only 4% of respondents said that their entire application landscape has been moved to the cloud, with the biggest group of participants (35%) indicating that up to a quarter of their applications are now cloud-based. (See Figure 12.) We are seeing an increased number of companies virtualizing their applications as the first step towards moving to a public or private cloud. We view hardware virtualization as an enabling technology of cloud computing. Virtualization is essentially commoditizing hardware. It enables IT to disconnect its applications and environment from the hardware and move applications quickly regardless of what platform they reside on. Virtualization eliminates configurations at the hardware level by providing a layer of abstraction – paving the way for companies toward cloud computing.

Q: What percentage of your company's applications are virtualized by your internal IT department?

Figure 12: The majority of companies deploy a quarter of their applications on the cloud.



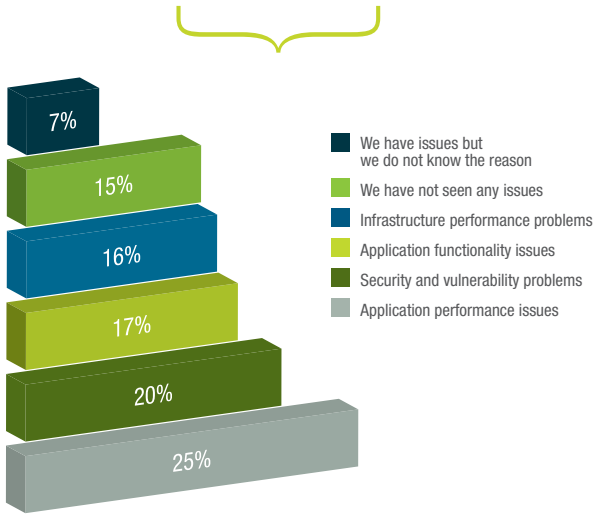
Despite the Service Level Agreements (SLAs) offered by cloud vendors, moving applications to the cloud still represents a major shift in architecture. Applications cannot be deployed without thorough testing and validation. In fact, a quarter of all survey respondents indicate that they encountered application performance issues within the first few months of moving to the cloud infrastructure, followed by 20% who experienced security and vulnerability problems. (See Figure 13.)

We believe that within the next 12 months, a growing number of organizations will begin to take advantage of the cost savings and agility that cloud computing has to offer. From a testing perspective, our survey found that over half of the respondents' companies have already begun to leverage cloud architecture for their testing efforts, such as hosting their testing environments on the cloud or generating load traffic for performance testing from the cloud.

The key to the successful adoption of cloud architecture is in finding the right balance between the predictability and control of traditional datacenter environments and the agility and speed of cloud-based deployments. With proper processes and testing practices in place, organizations can minimize the risk and rationalize their IT infrastructure using new cloud technologies.

Q: If you host applications on the cloud, what are the top issues that you encounter within the first few months?

Figure 13: Just like applications deployed on a physical infrastructure, cloud applications need to be thoroughly tested to avoid production problems.



industry trends:

Consumer Products and Retail: Using the Downturn to Drive Improvement

By Brian Girouard, Leader, Global Consumer Products & Retail, Capgemini

In this year's report, we selected six specific industries to profile: Consumer Products and Retail, Distribution and Logistics, Financial Services, Public Sector, High Tech and Telecommunications. Each industry section contains a high-level overview of dominant IT tendencies, as well as specific findings from our IT professionals' survey on QA trends, IT investments, outsourcing and adoption of new technologies and methods.

Consumer Products and Retail (CPR) is one of the broadest industries, combining food and beverage manufacturers, makers of health and beauty products, and several other sub-sectors involved in making and distributing common goods used by consumers.

CPR companies rely heavily on enterprise resource planning (ERP) and customer relationship management (CRM) systems, as well as supply chain management applications. Some companies have global instances of these systems to help manage their product development, supply chain, sales and marketing activities. Others have regional or divisional systems.

Traditionally, the role of IT was seen as a supporter of the business functions, but not as an equal partner responsible for the success of the overall mission. This view is changing rapidly. With increased competitive pressure, growing business and supply chain complexity and the ever-increasing amount of information about consumer behavior and industry trends, the business is beginning to see IT as a collaborative partner. As a result, companies are placing a greater premium on aligning business and IT priorities.

In particular, the area of predicting and monitoring consumer demand and balancing it with the supply of available products demonstrates the strongest synergy between business and IT. Demand for consumer products can often be volatile, and the recent downturn in the economy has shifted consumer buying patterns. To remain competitive, companies need to be able to capture, understand and respond to demand data from consumers in a timely manner. They need sophisticated, comprehensive and integrated IT systems that can accurately measure and predict demand trends, as well as tightly manage the product supply chain. A slight misbalance between supply and demand results in either too much product in the value chain or not enough to satisfy the customer's appetite, sometimes resulting in empty shelves (lost sales).

When asked about the greatest challenges facing their organizations in the application lifecycle, CPR respondents highlighted the following three areas: getting business consensus on the right investment (27%), understanding business requirements (27%) and getting development right (20%). Not surprisingly, when asked about the relationship between business and QA, the majority of the IT professionals from CPR companies (63%) say the business believes the only role of QA is executing test scripts. This is the highest percentage among all industries, indicating a significant disconnect between the business and QA.

The lack of relevant industry domain expertise among testers in the CPR sector also points to the misalignment among different organizations as well as a siloed approach to application quality. On average across all sectors, 10% of all respondents say their testers have "very little" expertise, 72% have a "few years" and 18% consider themselves "true domain experts." By comparison, CPR respondents say that 67% of their testers have little business knowledge, and none can be considered industry domain experts. (See Figure 14.)

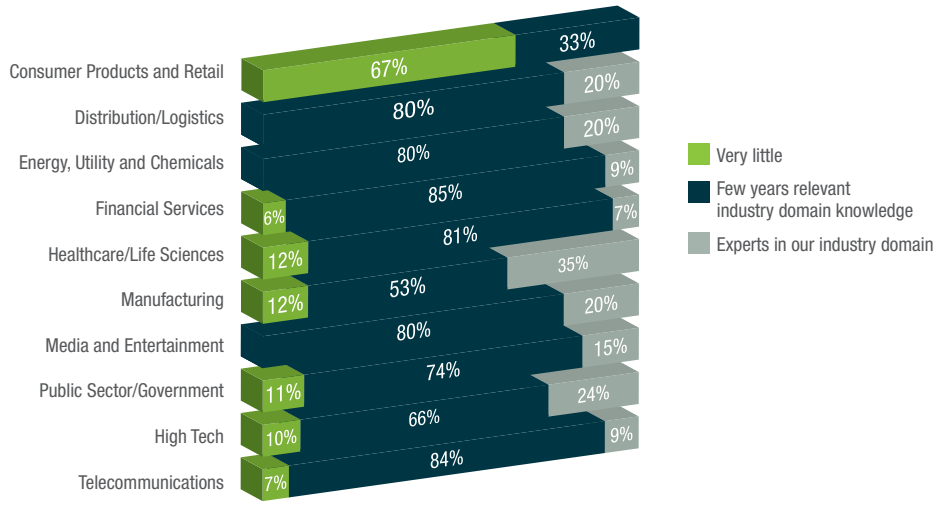
The key to improving application quality is to re-examine the relationship between business and QA and make quality a true part of the application lifecycle – from gathering requirements to monitoring the application in production. This approach will also help improve the relationship with outsourcing vendors. Almost one half of CPR respondents indicate that their companies are leveraging outsourced resources for testing and are planning to increase their use of offshore vendor services in the next two years. By streamlining communication between business and IT and making quality a part of every stage of the application lifecycle, companies will be able to get better results from their outsourcing engagements and achieve greater efficiency in their quality processes.

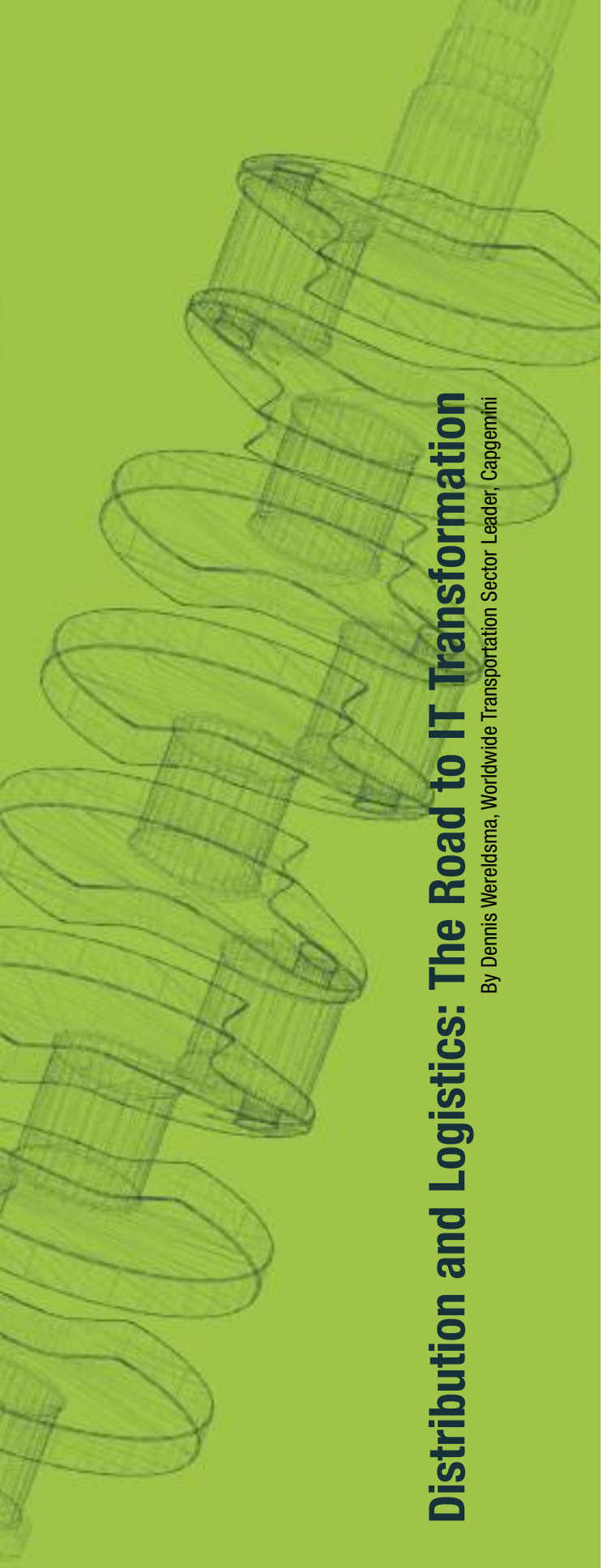
CPR companies will need to make changes to their quality processes in the near future. Their agility and competitiveness depend on it. In addition, as many of these companies produce products for human consumption that are subject to government regulations, they need to have systems and processes in place to ensure that products are being handled correctly and can be recalled if necessary. Only integrated and reliable IT systems can truly support the entire product lifecycle – from manufacturing to sale or recall.

The recent recession has led CPR companies to focus on improving business and operational efficiency. Organizations are working on reducing their overall inventory and localizing their offerings to be more relevant for consumers. CPR companies are beginning to invest their IT dollars into getting closer to consumers and better managing their supply chains throughout the business. The survey shows that CPR is among only three industries (the others were Media and Entertainment, and Telecommunications) that indicated an increase in IT spending – despite the challenging economic conditions. Respondents from the CPR sector agreed that their companies are continuing to invest in new IT projects – and not just those generating immediate ROI.

Q: How much relevant industry domain knowledge do testers in your organization have?

Figure 14: CPR testers have less business knowledge compared to other industries.





Distribution and Logistics: The Road to IT Transformation

By Dennis Wereldsma, Worldwide Transportation Sector Leader, Capgemini

Consistent with the other sectors profiled in this report, Distribution and Logistics is a diverse segment that includes a variety of logistics and transportation service providers: freight forwarders, postal service providers, the maritime sector, rail and even airlines and airports. Naturally, each sub-sector has a very different approach to IT with a different set of priorities. However, in analyzing the companies in the Distribution and Logistics sector, we discovered that some of the most interesting trends in IT are emerging among the logistics service providers, so we chose to focus on the freight forwarding sub-segment for a more detailed analysis.

Freight forwarding companies rely heavily on IT systems for their core transportation functions, such as scheduling, planning and dispatching. However until recently, there has not been a standard ERP-like packaged solution on the market to support this very specialized sector. As a result, each freight forwarding provider resorted to building its own custom set of IT applications. Depending on the size of the provider and the complexity of its operations, these dedicated systems often take several years to build and require substantial effort to maintain and keep up-to-date.

The real issue with custom systems is that they can be extremely difficult to integrate when companies' IT systems merge. Logistics companies typically grow by acquisition, with larger providers absorbing smaller players and their operations. After several acquisitions the company's IT landscape becomes cluttered with redundant systems – some obsolete and others still supporting disjoined, specialized functions. These systems are too costly to maintain and too difficult to integrate with newer software packages, but almost impossible to retire. Our research shows that logistics operators are at a pivotal point in their IT transformation journey. Many companies are trying to define the roadmap for rationalizing their application landscape to achieve greater agility, security, reliability and compliance, but the change may not be as fast as in some of the other sectors – such as Financial Services or Telecommunications. Logistics is a low-margin industry that has traditionally invested most of its resources in keeping its vehicles running and goods delivered, not advanced IT technology. Only about 2% of logistics companies' annual revenue is spent on IT, and over 60% of all surveyed logistics providers still admit that the alignment between business and IT needs improvement (Source: The State of Logistics Outsourcing, 2009 Third-Party Logistics, Capgemini).

Nonetheless, change is coming. Seeing the potential and the growing market, two of the leading ERP providers – SAP and Oracle – have recently entered the transportation management application space. Oracle's new transportation management system is already available on the market, and SAP's new application is expected in 2011. We believe that many logistics companies will take advantage of these offerings to consolidate their processes and systems into a single, standardized application infrastructure.

Logistics providers are also feeling the pressure from their customers to build a global cross-industry IT platform using service-oriented architecture (SOA) and open-industry standards. This type of platform would enable logistics providers to streamline collaboration with customers, partners and regulatory agencies, while creating an efficient infrastructure and data repositories. Not surprisingly, logistics companies are turning to agile development methods to help them build new SOA platforms. Seventy percent of all survey respondents in the Distribution and Logistics sector say that they are leveraging agile in their application development and delivery practices, and all respondents say that they use integrated automation tools to support their agile initiatives. (See Figure 15.) The number of projects where agile is used is still small – typically under a quarter of all IT projects – but we believe this indicates the beginning of the true IT transformation in the logistics sector.

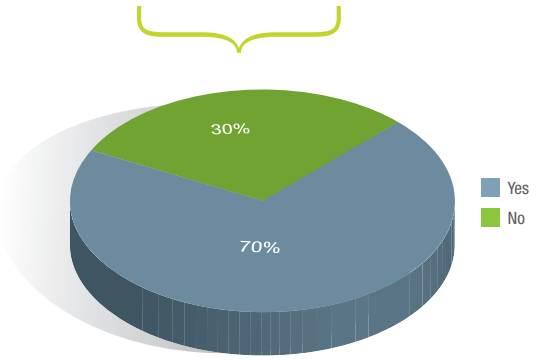
Logistics companies are often unwilling to decommission old applications for fear of potential disruptions to shipment tracking, customer invoicing and virtually every other area of their operations. They are also not able to easily purge old data that continues to grow uncontrollably – due to compliance and data retention requirements. At the same time, many companies admit that they cannot continue to operate in this fashion, spending up to 80% of their IT budgets supporting ever-expanding datacenters, aging infrastructure, multiple data repositories and complex one-off integrations.

Logistics and transportation companies are also beginning to bring their applications to the cloud to reduce hardware requirements, improve application quality and performance and reduce maintenance expenses. Even traditional service providers, like the Postal Service, are beginning to look for new ways to increase revenue and boost operational efficiency. To remain competitive, they need to look beyond their traditional modes of operations and enter new business arenas with quick, convenient, easy-to-use and reliable customer-facing applications. To bring large volumes of new systems to the market quickly, providers are turning to virtualization technologies that offer the advantage of faster development times, increased quality and shorter deployment and QA cycles.

We believe that adoption of new technologies and methods – such as agile delivery and virtualization, as well as modernizing the application landscape and developing global IT platforms – will fuel the future growth of logistics service providers. As the economy continues to recover and companies increase their IT spending, we will see more investment going toward strategic projects and initiatives.

Q: Do you leverage agile development/delivery methods in your company's ALM?

Figure 15: The Distribution and Logistics sector is at the forefront of adopting agile delivery methodologies.



Financial Services: New generation demands new solutions

By Jim Washburn, Vice President, Banking Sector Practice Leader, Capgemini

The Financial Services industry is composed of three broad sectors: Insurance, Banking and Capital Markets. In this section, we will focus our attention on the banking sector and the strategic IT initiatives that are helping to revamp the banks' entire distribution system and change the way banks interact with their customers.

In 2010 the world's banks and other financial organizations are undoubtedly still feeling the effects of the recent economic crisis. However, it is not the recession that is changing the way that banks are conducting business. The emergence of a new generation of customers is making banks rethink their entire distribution systems. Today's 20- and 30-year-olds have little interest in walking into a traditional bank and talking to a teller. Unlike their parents, they rarely use call centers or balance their checkbooks. This new generation of banking customers prefers to conduct most of its transactions online through its computers or increasingly on mobile devices.

Unfortunately, today's banking distribution system is not built to support this next generation of wealth. Most banks still offer little more than a utilitarian web presence, and unlike sophisticated online retailers, banks are not yet taking advantage of the tremendous amounts of personal information and behavior patterns that they collect on their customers. Today's banks are not yet able to effectively use their customer data to create personalized offers or suggest services based on individual customers' choices and preferences.

Banks continue to invest money in new projects, with areas such as web presence and data warehousing attracting the most IT investments. They need to be able to fully modernize their distribution channels in the next five to ten years to be able to keep pace with younger consumers. This means transforming each transaction into an electronic sales channel and consolidating data to better understand behavior patterns to deliver a personalized experience on the web and through mobile devices.

To support this transformation, banks are beginning to take inventory of their IT assets and are taking steps towards updating their application landscape. Many of today's banking sector companies rely on custom-developed legacy applications that are in excess of 20 years old. These systems require extensive maintenance, are not well integrated and are generally not the types of engines that could support a company's future growth. Many financial institutions have already begun the process of replacing these custom systems with packaged applications, and as the economy continues to recover, we expect to see more banks investing in application modernization.

Like most other sectors, banks have reduced their IT spending during the recession. However, 80% of our survey respondents say that their companies are continuing to invest in new IT projects. This clearly shows that Financial Services companies are continuing to fund their IT initiatives, but are careful to focus their investments on the most strategic projects – such as web presence and application modernization. (See Figure 16.)

New types of applications require new delivery methods – Financial Services organizations were among the earliest adopters of agile. Through continuous collaboration with the business, IT is able to deliver new business functionality in short, frequent cycles. In our survey, over two thirds of respondents from the Financial Services sector indicate that their companies are leveraging agile in their ALM.

Financial Services organizations are also improving their IT agility through more effective resource management. Close to 70% of our survey respondents say that their organizations are using outsourced services for testing and nearly half indicate that their reliance on outsourcing vendors is increasing. Cost is not the only driver behind the growing dependence on outsourcing. Outsourcing can provide a variable resource for organizations to deliver services on-demand quickly and efficiently, as well as add industry and process expertise. In fact, over half (56%) of survey respondents in the Financial Services sector suggest that they would increase their use of outsourced vendors even further if they could receive more value-added services such as industry-specific quality solutions, pre-built requirements, test cases and automation components.

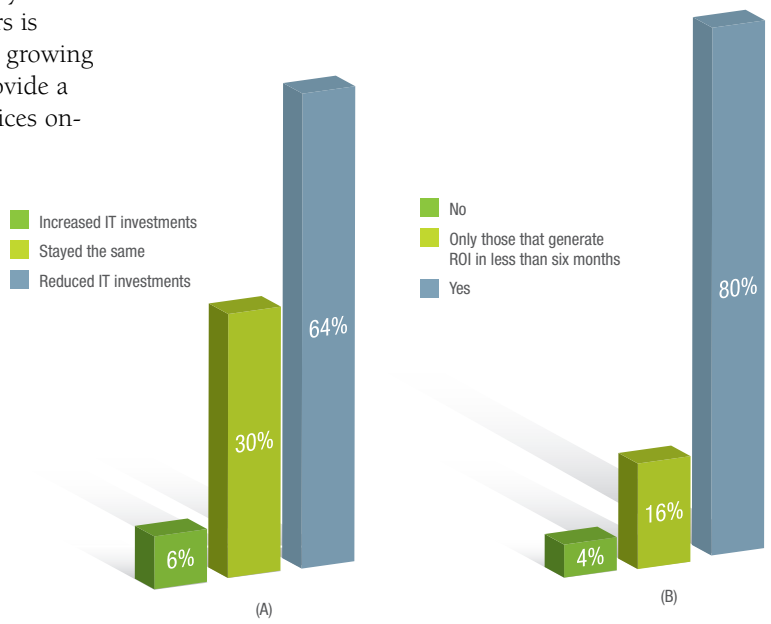
In general, the banking industry continues to be optimistic about the current state of IT investments and emerging trends in software development and quality. Financial Services companies – and specifically banks – are among a small number of regulated companies where application performance testing is considered a requirement. Banking and investment banking applications require precision in testing that is not commonly necessary in other industries. With multi-trillion dollar transactions taking place daily between financial institutions, accuracy and precision are required for all IT applications. For example, all calculations must be tested up to seven decimal points – as fractions of pennies add up to large amounts in the financial industry.

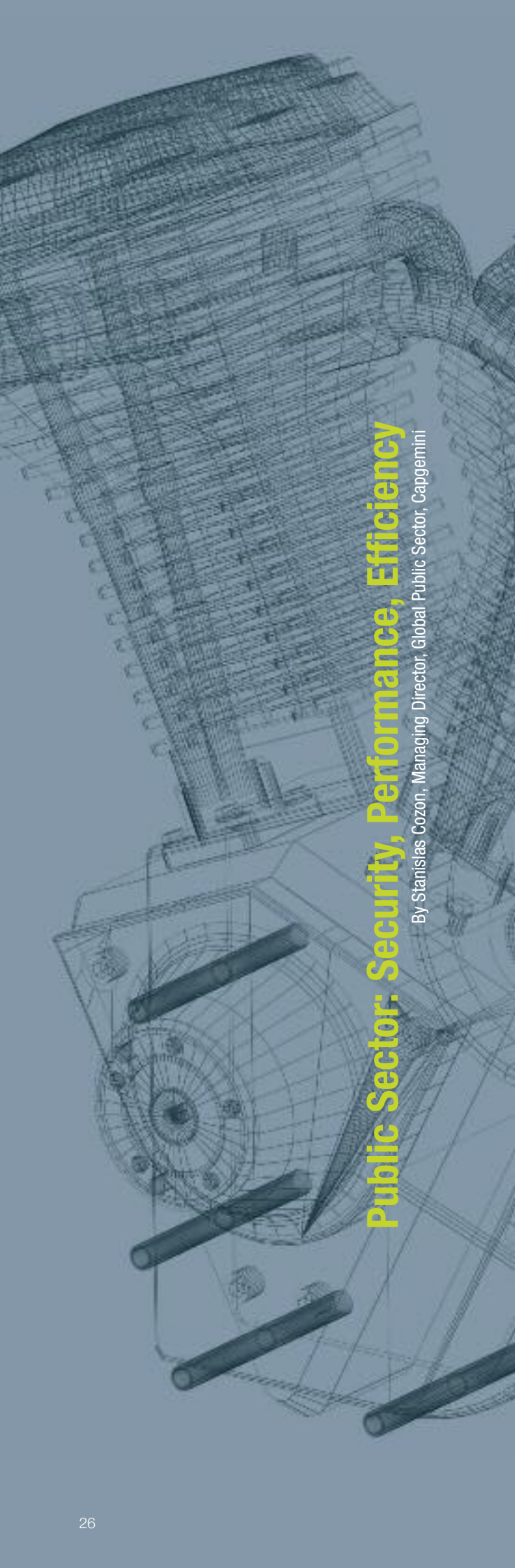
We believe this sector will see more technological advancements in the next five years than it has experienced in the previous ten. New technologies will emerge that will support the next generation of consumers. New tools and delivery methods will continue to bring more functionality in shorter cycles. Modernized application landscapes will bring efficiency to IT applications – resulting in new, integrated services that banks are able to provide to their customers. In the end, customers will experience a level of quality and consistency that is higher than anything that is available today.

Q(A): How have the current economic conditions affected your organization's IT investments?

Q(B): Is your organization still investing in new application development projects?

Figure 16: Financial Services companies are shifting their investments to the most strategic IT projects.





Public Sector: Security, Performance, Efficiency

By Stanislas Cozon, Managing Director, Global Public Sector, Capgemini

Capgemini's global Public Sector includes organizations in five primary areas: Tax and Welfare, Public Security, Healthcare, Regional and Local government, and Defense. This is a complex and diverse sector that encompasses both local government bodies and large international organizations such as the IMF, UN or NATO.

All government organizations are subject to strict rules and regulations that impact their IT practices and policies. Although these regulations are often unique to each sub-sector, all mandate that government organizations maintain secure, efficient and cost-effective IT systems – not just for storing, but also for analyzing and sharing information. For instance, healthcare organizations are required above all to protect patient privacy. At the same time, they need to securely share information between hospitals and other facilities to help providers gather complete data on the patients' health, diagnosis and treatments.

Depending on their function, government agencies use a variety of technologies, from ERP and CRM packages to highly specialized analytical applications, to help identify criminals or calculate the amount of carbon emissions in compliance with environmental regulations. With IT budgets shrinking and the public eye closely focused on how the government spends its resources, agencies are beginning to take a more strategic approach to their investments – re-examining ROI, re-evaluating project success and optimizing their IT infrastructure. Most of the current investments in IT are focused on projects that promise greater cost savings and efficiency in the context of operational excellence and improving the customer experience.

One such strategic initiative is data centralization. With strict requirements for retention of sensitive data, many Public Sector IT organizations face the problem of data growth imbalance – datacenters are expanding faster than information can be removed. Agencies are working on creating a clear strategy for controlling data growth, securely archiving sensitive information at a central location and building data growth control into their IT operations and processes.

Another initiative that is aimed at increasing efficiency and reducing costs is moving applications to the cloud. Although the percentage of applications that are being tested through the cloud are still relatively small, all of our government sector survey respondents confirm that they intend to be moving some of their applications to the cloud in the next three years.

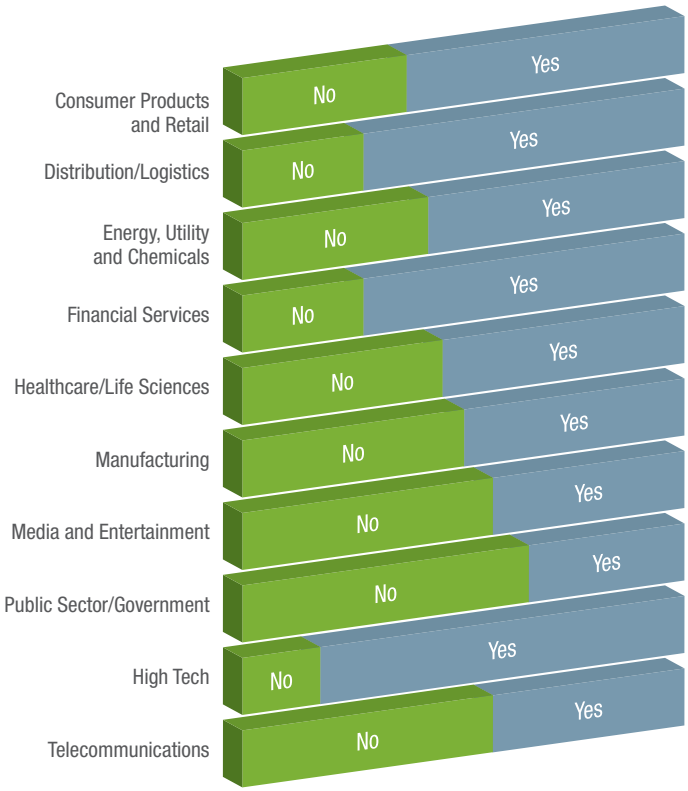
Quality is of particular importance to government organizations. While a poorly performing or temporarily unavailable application may cause a private sector company to lose revenue or customer satisfaction, a similar problem can be disastrous for a government agency that deals with crime prevention, tax collection, healthcare, immigration and many other aspects of public service and security. Equally important is being able to maintain the citizens' trust in the government's ability to safeguard personal information and sensitive data. Not surprisingly, most government organizations have a well-defined ALM methodology that is being consistently followed in the majority of development and testing projects. The government sector survey participants also have the highest number of responses for following a standard methodology: TMMI, TMap® and Six Sigma.

Perhaps it is the stringent adherence to traditional quality methodologies and the complex, highly regulated nature of government applications that makes Public Sector organizations slow to adopt agile methods. Our survey shows that public agencies are behind all other industries in leveraging agile delivery methods in their ALM. (See Figure 17.) Nearly 69% of respondents in the Public Sector say that their organizations do not use agile methods, and among the remaining 31%, agile is being used in less than 10% of all applications.

Traditionally, government organizations did not offshore IT or QA functions. Perhaps once again it is the highly sensitive and secure nature of government IT applications that prevented public agencies from forming technology partnerships with outsourced vendors. However, recent quests for efficiency are influencing many Public Sector organizations to re-evaluate their approach to offshoring. Agencies of all types and sizes are finding ways to separate their core functions – such as social services or police protection – from supporting IT functions to gain efficiency and effectiveness. If a local permit office has quick access to the database containing relevant information about zoning and the most up-to-date requirements, they will better service their clients. They may even consider opening a self-service portal for customers to find information and apply for permits online.

Not surprisingly, Public Sector organizations are slowly changing their attitude toward outsourcing. Nearly a third (32%) of survey respondents say that their agencies are leveraging QA outsourcing, and 21% suggest that they plan to increase the use of outsourced resources in the near future. Similar to private sector companies, government agencies are looking for more value-add services from third-party providers. A third of all survey respondents say that they would be more likely to use outsourced testing resources if they delivered more value-added services such as industry-specific knowledge or offered expertise and methodology in testing specific applications such as SAP.

Rising costs, an aging population, drops in government revenues due to slow economic recovery and growing citizens' expectations for more personalized services are forcing government agencies to start reshaping their IT solutions. The future of government IT lies in improved efficiency, agility, reduced administration costs, improved quality and security. We believe that government agencies will continue to take advantage of the new technologies such as agile and virtualization, and improve efficiency through outsourcing and application modernization.



Q: Do you leverage agile development/delivery methods in your company's ALM?

Figure 17: Government agencies are slow to adopt agile.

High Tech: Quality as Competitive Success Factor

By Guido Kamann, Vice President, Global High Tech Sector, Capgemini

Capgemini s High Tech sector combines a diverse group of companies involved in computers and peripherals, consumer electronics, printing and imaging, telecommunications equipment, software and services and semiconductors.

High Tech companies have been among the fastest growing businesses around the world, fueled by insatiable consumer appetite for faster, more powerful computers, smarter mobile phones and the latest electronic gadgets. Traditionally, technology companies have not been in the forefront of quality. The slogan "it's better to be first than to be better" aptly implies that software developers and equipment manufacturers rush to get their latest products to market to beat the competition without much regard for quality. Consumers have been generous and forgiving. They have accepted that they may have to wait for the second or third release of a new product or for a service pack for the new software package before they can really trust it with their personal data or business processes.

As technology continues to advance and competition heats up, the focus of technology companies is beginning to shift toward quality. Today's High Tech companies are working as part of elaborate ecosystems of suppliers, partners, service providers, distributors and other essential functions. For this complex chain to work, participating companies have to provide the highest quality products, parts or services. Otherwise, the relationship and trust between partners will be broken, and the delicate system will collapse.

Perhaps even more important is the fact that consumers are beginning to perceive product quality as a competitive differentiator. For high tech devices, quality is not simply about having a product that works as expected and doesn't have any obvious problems. With so many products to choose from – many featuring similar capabilities – customers see quality as the combination of usability, design and the overall user experience. When asked to compare one smart phone model to the next, customers often talk about their preferred product's "quality" – ease of use, breadth of coverage or the variety of available applications and plug-ins. This clearly shows that quality in the technology sector has truly become a competitive advantage. Companies that deliver the most positive user experience can forge ahead.

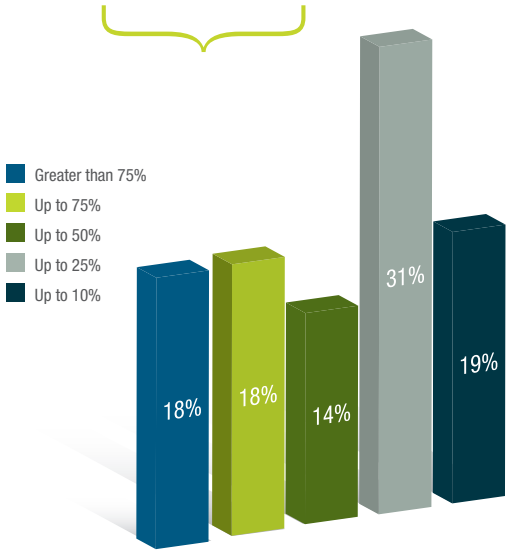
Our survey respondents concur that application quality has improved over the last two years, although the amount of IT spending has been reduced. Technology companies achieve higher quality with limited resources through efficiency and innovation. They were among the first to adopt agile delivery methods, and continue to be on the forefront of agile adoption. Almost 80% of survey respondents indicate that their companies use agile. Of the respondents using agile, 36% of participants say that over half of their applications are being developed by leveraging agile methods. (See Figure 18.)

High Tech companies were also among the first to embrace the concept of moving their applications to the cloud to free up datacenter resources and optimize their IT infrastructure. They remain forward-looking, planning to test 25% or more of their applications through the cloud in the next three years.

Technology companies are not as open to outsourcing of testing services as some of the other sectors. In our survey, they were behind only Distribution and Logistics and Public Sector organizations in preferring to keep their testing function in-house rather than leverage offshore resources. This is not unexpected, since the reason for outsourcing is to focus attention on the core business while outsourcing supporting functions such as QA. For technology companies, developing and testing applications and products is the core business, so not surprisingly they prefer to keep quality closer to the development process. High Tech has the highest number of respondents (76%) who say that their business does not see the primary function of QA as simply executing test scripts. With so many technology companies following standard QA methodologies like TMap® and TMMI, they make QA a true partner in their application delivery process.

Q: What percentage of your application delivery projects leverage agile methodology?

Figure 18: High Tech companies remain in the forefront of agile adoption.



Telecommunications: Continuing to Invest in IT

By Greg Jacobsen, Group Director, Telecommunications Sector, Capgemini

For the purposes of this report, we grouped telecommunications providers and network equipment manufacturers into the Telecommunications sector.

The Telecommunications sector is very diverse, yet many companies share similar trends:

- Most companies in the Telecommunications sector are mature, global providers
- They rely on IT to manage their core functions such as billing, customer relations and business intelligence
- Despite the economic downturn, these companies continue to invest in IT, making it their second largest capital expense
- Most companies in this sector – specifically telecom operators and network equipment providers – are subject to strict government regulations, significantly affecting how they retain and store data and deal with the customers' private information

All of the leading global telecom operators are striving towards moving their customer interaction entirely online in the next three to five years. Once the self-service systems are implemented, customers should be able to change their phone service, pay their balance or add features without having to call or e-mail the help desk. This initiative is fueling substantial investments into the development of self-service portals and integrating them into the companies' ERP and billing systems. Our survey results confirm that Telecommunications companies are continuing to heavily invest in new IT projects. Close to 76% of respondents in the Telecommunications sector said that their companies are still investing in new application development, and 12% said that their IT resources are focusing on applications that generate immediate ROI.

The other emerging trend in the Telecommunications space is the move to consolidate, centralize and simplify the companies' strategic IT systems. Rather than rely on a collection of custom, loosely-integrated applications, telecom operators are selecting one preferred provider for each operations domain (ERP, billing, CRM, business intelligence and online self-service portals) and implementing it with as little customization as possible. Standardizing on a single system for each domain provides a significant cost advantage and reduces maintenance expenses. Most importantly, it greatly improves application quality and reliability – when literally hundreds of custom-built systems are replaced with modernized, off-the-shelf packages.

The change may not come easy to many users who are accustomed to working with the old systems. Additional challenges come from the global nature of many large telecom operators – where regional providers were traditionally free to select and implement their own IT systems. However, the trend is clear – most large operators are moving away from one-off systems or heavily customized packaged applications in favor of efficient implementations, streamlined processes throughout the organization, consistent user experience and standardized quality metrics.

With consolidated systems and fewer customizations, it is becoming easier to gather requirements and track changes. In the past, it used to take six to twelve months for a working group to capture requirements for a new system or upgrade – only to find out at the end of the process that these requirements have become outdated and no longer meet the needs of the business users. The new approach is based on off-the-shelf capabilities of selected packaged applications and minimal modifications to support the company's most essential business processes.

The consolidation movement seems to come at a good time for the Telecommunications industry. Nearly 89% of our survey respondents in the telecom vertical agree that application complexity is increasing and 69% admit that the greatest challenges for their IT organizations are capturing business requirements and managing change.

Overall, the survey found that telecom QA professionals are optimistic about their applications' quality (81% believe that quality has improved over the past two years), and they are among the most consistent followers of testing processes across projects (83% indicate that testing processes are followed in more than half of all IT initiatives).

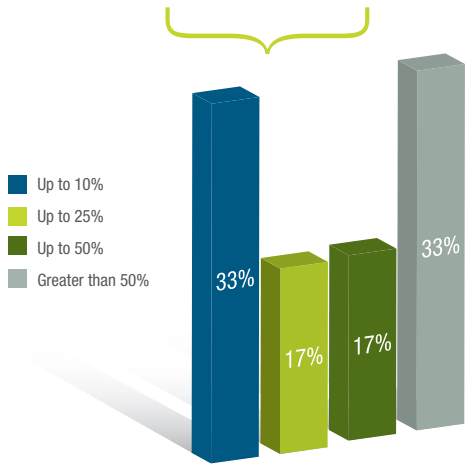
It is the mature, consistent and repeatable approach to quality that makes outsourcing a success for many telecom companies. Over 40% of survey respondents indicate that their companies are increasing the number of outsourced testing projects – the third highest percentage surpassed only by Financial Services and Consumer Products and Retail. Interestingly, 50% of respondents say that they would further increase the volume of their outsourced projects if their vendors offered specialized expertise and methodology for testing applications such as SAP, which is consistent with the move towards application consolidation.

Telecommunications is also in the forefront of adopting virtualization technologies. All survey participants in this sector indicate that they are planning to test their applications through the cloud in the next three years. Of this group, 33% indicate that they expect to test over half of their applications through the cloud. (See Figure 19.) This is the highest number among all verticals, and clearly indicates this sector's commitment to technology, application quality and innovation. In many cases, telecom operators are acting as providers of cloud services allowing their customers to save on infrastructure costs by deploying applications on their providers' clouds.

Similar to the trend we saw in the High Tech sector, for telecom operators, quality means more than just proving certain product features or ensuring that their service is working without interruption. To stay competitive and meet the demands of the highly discriminating consumer, telecommunications companies need to provide a complete user experience including security, speed, service and feature set. We believe that this sector is very well positioned to take advantage of the latest technologies and trends to continue its path of innovation, efficiency and modernization.

Q: What percentage of your applications do you expect to test through the cloud in the next three years?

Figure 19: Telecommunications companies are committed to cloud-based testing.



economic impact

2010 is showing promising signs of economic recovery. Even as IT spending begins to rise, companies are not likely to fully return to their pre-recession practices. The recessionary years have left a long-lasting effect on the economy and have fundamentally re-shaped many current and future quality trends.

Businesses are using the downturn to take an inventory of their IT portfolios and re-evaluate their spending patterns. They are finding that a large percentage of their resources were being spent on "keeping the lights on" activities – maintaining legacy applications that no longer support critical business processes – rather than investing in strategic projects that promote innovation and growth. Companies are also closely examining their IT infrastructure to identify ways to reduce maintenance expenses and increase efficiency.

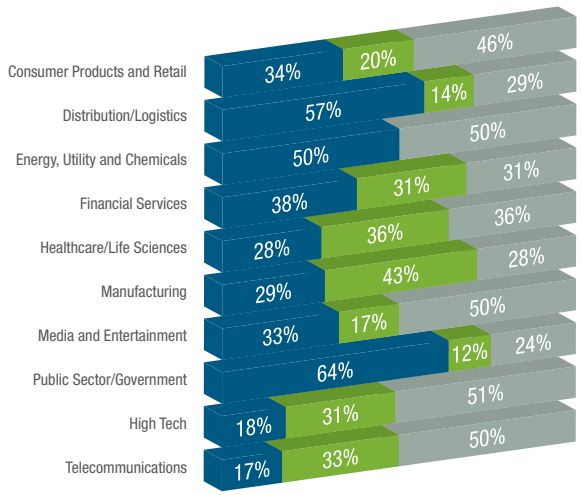
Furthermore, companies are also changing their approach to outsourcing. They are no longer looking to simply augment their workforce, but are expecting more value-add from their outsourcing partners. Additionally, across all industries, companies are making a shift in the types of projects they invest in, focusing on initiatives that provide quick ROI. To support this change, they are beginning to change their application delivery processes in favor of methods that produce higher quality applications faster. We believe that the rapid advancement of cloud technologies and agile delivery methods are in no small part the result of the recent recessions and the companies' quest for efficiency in the tough economic climate.

Hosting applications on a cloud helps reduce infrastructure costs

As discussed earlier in this report, virtualization technologies are helping companies increase the efficiency of their IT infrastructure by hosting applications on the cloud. They can increase application capacity and plan for peak loads without increasing the size of their datacenters and associated maintenance costs. Survey data indicates that across all industries and geographies, companies are leveraging cloud testing and are planning to increase the number of hosted applications in the next three years.

Agile delivery methods help businesses focus on projects that bring fast ROI

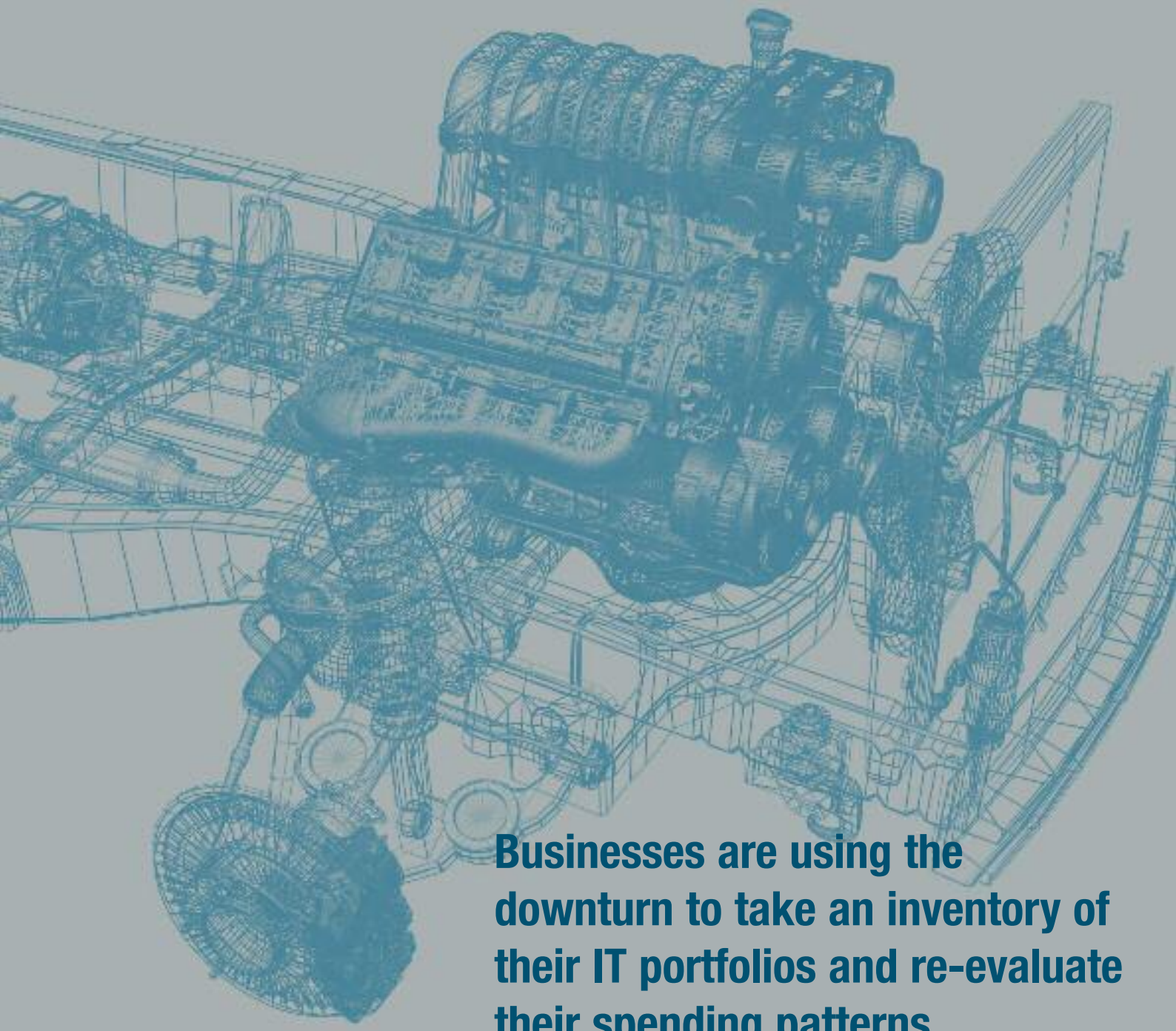
Despite the challenging economic times, companies continue to invest in new application development projects. However, the focus is shifting from complex multi-year systems to quick and nimble applications aimed at improving the company's competitive edge and generating quick ROI. Traditional application development methods cannot support building, testing and deploying an application in six months. However, new agile methods can prove project ROI much earlier in the application lifecycle and allow companies to quickly adapt to changing market needs, while reducing waste. Naturally, a growing number of companies across all industries are beginning to adopt agile methods – at least for a portion of their projects. (See Figure 20.) Although agile delivery practices have been around for over 10 years, the economic downturn and the need to focus on faster returns is renewing interest in agile and fueling its rapid adoption.



Greater than 50%
Up to 50%
Up to 10%

Q: What percentage of your application delivery projects leverage agile methodology?

Figure 20: Companies across all industries are adopting agile delivery methods.



Businesses are using the downturn to take an inventory of their IT portfolios and re-evaluate their spending patterns.

Summary

The 2010-2011 World Quality Report offers both a quantitative and qualitative view of the emerging trends in QA testing and a forecast of how these trends will shape ALM in the future. Companies have historically invested in the defect tracking and test automation components of ALM. We expect to see investments shift towards requirements visualization, business flow modeling and test environment and data management. However, in order to secure funds and commitment for future investments, organizations need a well-defined and accepted process for measuring ROI as well as a complete implementation, integration and adoption strategy.

IT organizations are more consistently using ALM and testing methodologies, but their practices are still mostly proprietary, not based on industry standards. Many organizations develop and document their own best practices, which may not afford them the full benefits and efficiencies offered by a more standard, widely accepted methodology.

The profile of a tester is changing rapidly. Most companies are now looking for testers who have both strong technical skills and relevant domain and business knowledge. In addition to being knowledgeable about automation technologies, testers need to be able to understand business requirements and create test validation for specific business needs.

Despite the recent recession, companies are still investing in new IT projects. Many industries are using the downturn to re-evaluate their IT spending and focus on the most strategic projects – such as standardizing their IT systems, modernizing their application infrastructure, improving application quality and re-tooling their applications to serve the new generation of customers. Many companies still prefer to focus their resources on projects that generate fast ROI. As a result, agile delivery methods are gaining popularity across all industries and geographies. This survey – along with other industry studies – found that over 60% of all companies have either already adopted agile methods or are planning to do so in the near future. Another emerging technology trend that helps companies improve IT efficiency is cloud computing. Companies move their applications to the cloud to be more agile, to better plan for capacity and to reduce datacenter maintenance expenses. IT organizations are also beginning to use cloud technology for application testing – for hosting testing tools on the cloud, generating traffic for performance testing or building up the test environment using cloud services.

Outsourcing continues to play a key role in quality management and, by all indications, this trend will increase over the next few years. The majority of surveyed IT professionals prefer their QA vendors to be co-located with their company employees where they can have more streamlined communication and collaboration. This is also true for agile projects – communication is the key component to successfully outsource agile project testing. With the right processes in place, almost half of all companies are leveraging offshore resources for their agile projects today. Additionally, organizations are now looking for their outsourced vendors to provide more specialized, value-added services and assets – not just an extension of the company's workforce. Similar to preferences for in-house testers, companies are looking for their vendors to have a better understanding of the business domain. While the economic climate is improving, application quality trends and practices are not likely to fully return to their pre-recession state. Companies are using the downturn to re-tool and re-focus and will emerge with renewed commitment to application quality, agility and efficiency.

About the Study

The World Quality Report Survey was sent to over 30,000 CXOs, IT directors, QA managers and engineers at various companies around the world. All major industries are represented in the survey: Consumer Products and Retail, Distribution and Logistics, Energy, Utility and Chemicals, Financial Services, Healthcare/Life Sciences, High Tech, Manufacturing, Media and Entertainment, Public Sector, and Telecommunications.

The survey also has a good distribution of company sizes; 38% of respondents are employed by small companies (less than 1,000 employees) followed by 27% by enterprise companies (more than 20,000 employees), 18% by mid-size companies (1,000 to 4,999 employees), and 17% by large companies (5,000 to 20,000 employees). (See Figure 21.)

While over half of respondents come from North America (52%), other regions are well represented: Europe (30%), Asia (9%) and Rest of the World (9%). (See Figure 22.)

In addition to the responses collected from survey participants, the content of this report is supported by Capgemini Group's benchmark data carried out on client projects, best practices, and over 40 years of experience in testing and quality management.

Throughout the years, Capgemini and Sogeti have developed a range of best practices, including TMap® and TPI®, which are now accepted as industry standards around the world. TMap® is the Group's business-driven, risk-based methodology for structured software testing that is designed to address the key issues of quality, time and cost – across the whole development lifecycle of solution delivery. TPI® is the Group's model for the improvement of testing that offers insight into the maturity of the current test process and identifies improvement actions to accomplish the desired test maturity level.

Figure 21: Survey respondents by size of company

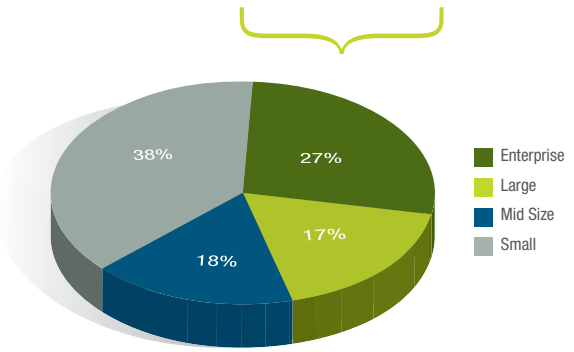
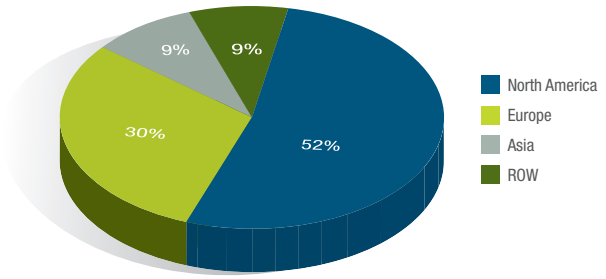


Figure 22: Survey respondents by geographies



About Us •

About Capgemini and Sogeti

The Capgemini Group is one of the world's foremost providers of consulting, technology and outsourcing services, enabling its clients to transform and perform through the use of technologies. Present in over 30 countries, the Capgemini Group reported 2009 global revenues of EUR 8.4 billion and employs over 90,000 people worldwide. Sogeti, its wholly-owned subsidiary, is a leading provider of local professional services, bringing 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. Capgemini and Sogeti have one of the largest dedicated testing practices in the world, with over 6,400 test professionals and a further 11,000 application specialists, notably through a common center of excellence with testing specialists developed in India.

More information is available at
www.capgemini.com/testing
www.sogeti.com/testing

About HP

HP creates new possibilities for technology to have a meaningful impact on people, businesses, governments and society. The world's largest technology company, HP brings together a portfolio that spans printing, personal computing, software, services and IT infrastructure to solve customer problems.

More information about HP is available at **http://ww.hp.com**

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We value your comments and ideas. We welcome you to contact us in relation to any questions you might have concerning the 2010-2011 World Quality Report.

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