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LEVERAGING AGILE TO ACHIEVE QUALITY WITH SPEED

Overview

In March 2015, Magenic commissioned Forrester Research to evaluate the current state of application development approaches, as well as the challenges, opportunities, and importance of quality in Agile development. What follows is that report's findings.

Magenic® // *Software to move forward.*™

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ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. Ranging in scope from a short strategy session to custom projects, Forrester's Consulting services connect you directly with research analysts who apply expert insight to your specific business challenges. For more information, visit forrester.com/consulting.

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Executive Summary

In the age of the customer, organizations need to develop and deliver modern applications that empower customers, partners, and employees with context-rich apps and smart products to help them decide and act immediately in their moments of need. Modern applications help enterprises win and serve new clients and retain customers. In other words, modern applications mean business growth.

This puts huge pressure on IT to quickly develop and maintain modern systems of engagement capable of meeting users' rapidly evolving needs. IT must ensure it is able to develop software with the right functional and technical quality to improve the user experience. This requires a whole new approach to software quality and testing (Agile, continuous, and automated) to increase the overall velocity of the software development life cycle (SDLC) and significantly boost application quality

In March 2015, Magenic commissioned Forrester Consulting to evaluate the current state of application development approaches, as well as the challenges, opportunities, and importance of quality in Agile development. Respondents were asked how they deliver modern applications at speed while maintaining quality. In conducting in-depth surveys with 100 cross-vertical IT and business decision-makers in the US, Forrester found that in order to deliver modern applications, IT and business decision-makers must adopt an "Agile all the way through" approach, incorporating Agile techniques in both upstream and downstream development to ensure applications are delivered with quality and at speed.

KEY FINDINGS

Forrester's study yielded four key findings:

› **Business leaders expect IT to deliver software quality with speed.** In the age of the customer, business leaders are becoming obsessed with customer experience with their organization. The survey revealed business leaders expect that their application development teams deliver high-quality products (84%) that deliver superior customer experiences (82%) at speed (81%). Speed delivery has always been a challenge in the past; now it is unprecedented and has to come with quality.

› **To realize its full potential, firms must adopt Agile all the way through the entire delivery cycle.** To keep up with user demands means that software development,

testing, and delivery must become a continuous and automated process. To succeed, it is imperative for organizations to embrace Agile concept in all steps of the definition and design, as well as the engineering, testing, and deployment of applications. It's "Agile all the way through" that helps truly reap the best business benefits in becoming Agile, enabling true business agility. Organizations are stepping up to the challenge, with over 90% of respondents highlighting they must invest in the skills, processes, and technology to build a modern application delivery organization.

› **Product owners play a pivotal role in the adoption of Agile.** Over two-thirds of organizations indicated the biggest challenge with adopting more Agile is a lack of skilled product owners from the business. For new applications to deliver their full value, the business must lead application development by defining and prioritizing continuously on the minimum viable product (MVP).

› **Organizations have a hard time with Agile testing.** To deliver software quality at speed, old testing organizations and practices don't work. Organizations are struggling with the new Agile testing practices, increased levels of optimization, and automation necessary to become more Agile. The survey also revealed that almost 40% of respondents look for external partners to modernize their overall Agile testing capabilities.

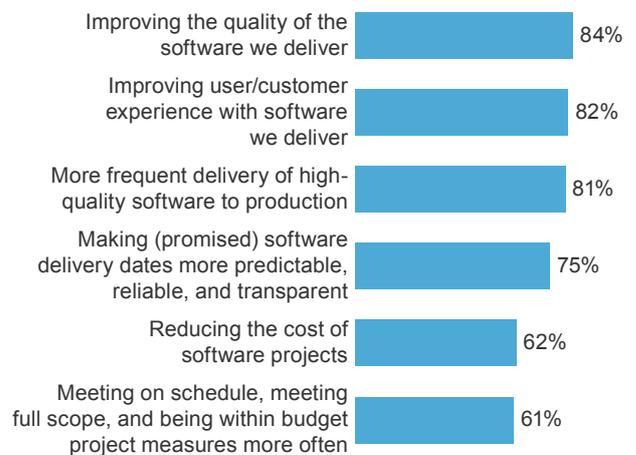FORRESTER®

Users Want Speed With Quality

In order to understand an organization's need to develop and deliver modern applications, Forrester asked 100 business and IT leaders what they considered to be the top demands placed on their application development group. The survey revealed that business leaders expect the app development team to: (see Figure 1):

› **Improve the quality of software.** Eighty-four percent of organizations surveyed indicated that business leaders expect the application development team to improve the quality of the software they deliver. Business leaders won't compromise on bugs in production. The price for such bugs in the age of the customer is high, as social media makes everything viral and software represents your brand. This makes bugs just too high of a business risk to accept. Similarly, we also know business stakeholders want the "right things" done with the right priority.

› **Improve customer experience.** In today's business ecosystem, customers and business users are in the driver's seat. They are increasingly empowered as they become more connected. The focal challenge for organizations today, which is key to commercial success, is to ensure that customer interactions meet customer experience requirements. As organizations become more customer obsessed, application delivery teams must deliver software that improves the customers' experience with their organization. They can do this by automating as much as possible the journey customers go through when interacting to buy a product or a service through their mobile device, tablet, or desktop. In fact, more than 80% of IT and business decision-makers indicated that they are being asked by business leaders to focus on systems of engagement applications that directly improve the user experience.[1]

› **Deliver software fast, but with high quality.** Over 90% of respondents stated that improving their time-to-market is either a true or moderately true statement when it comes to their application delivery needs. That said, 81% percent of IT and business decision-makers want more delivery speed as long as it comes with high quality. This means that while firms want to adopt modern Agile practices for speed, these practices cannot come without a revamped focus on quality assurance and testing. While long delivery cycles may work well for some applications, almost 40% of respondents highlighted that long and slow

delivery results in a loss of revenue, increased time-to-market, and loss of customer engagement in the business. On the other hand, not all applications require the same level of delivery speed.

FIGURE 1

Improving Quality, Customer Experience, And Faster Delivery Are Top Priorities For Businesses

"What are the chief demands placed on your app development group by business leaders?"

Improving the quality of the software we deliver	84%
Improving user/customer experience with software we deliver	82%
More frequent delivery of high-quality software to production	81%
Making (promised) software delivery dates more predictable, reliable, and transparent	75%
Reducing the cost of software projects	62%
Meeting on schedule, meeting full scope, and being within budget project measures more often	61%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015

FIGURE 2

Long Delivery Cycles Have A Direct Impact On The Business

"How does the length of application release cycles impact your business?"

Has a bad and direct impact on the business (loss of revenue, long time-to-market, lost customer activity)	38%
Long cycles work well for our business needs at the moment	26%
Long cycles currently work well for our business needs, but this is changing	15%
Has a bad but indirect impact on the business	11%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015

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Many Adopt Agile Expecting High Technical Quality, But Not Many Achieve It

Since Agile was brought to market almost 13 years ago, it has taken time for enterprises to truly be Agile in a way for it to seriously make a business impact. Introducing Agile at the team level might be easy, but the challenge is replicating success and doing it at scale to multiply the business benefits. Since 2010, when the industry entered the age of the customer, the demand for delivery speed has become unprecedented. The new rate of speed for delivery has reduced from months, to weeks, to days, to minutes, and even seconds (see Figure 3).[2] In fact, leading eCommerce organizations can now deliver new software features in production every 11.6 seconds.[3] While not all teams will get that type of demand from their business, our research shows that those deep in digital transformations have that demand just around the corner. Even a famous publishing company has seen one of its development teams reduce delivery time from seven days to 30 minutes. In this research, we found that 66% of US organizations surveyed have already adopted Agile for software development, with a further 22% planning to implement in the next 12 months.

Although that might sound like a high number of organizations leveraging Agile, we know that achieving the true benefits of Agile is not easy and takes deep organizational change as well as new practices in many areas of the development testing and delivery life cycle. We asked clients about their expectations of Agile and found that app dev teams do not achieve the expected benefits when introducing Agile (see Figure 4). In fact, teams expect Agile to:

› **Deliver better technical quality.** Seventy-four percent of respondents indicated an expectation of improved technical quality when using Agile. However, in reality, very few organizations realize this benefit — only 30% of respondents highlighted improved technical quality as a benefit that they achieve from using Agile.

› **Improve business alignment.** While almost 60% of respondents expect Agile to break down barriers between IT and the business by improving alignment, only 47% of organizations actually achieve this. However, the research shows that organizations may be better aligned than they think. More than half of respondents achieved greater predictability of results aligned with requirements through the adoption of Agile.

› **Improved functional quality.** Forty-eight percent of respondents expected to achieve improved functional quality from the adoption of Agile, with a similar percent (47%) realizing this benefit. In the age of the customer, where applications must be developed with the right functionality to improve customer experience, improving functional quality will only increase in importance.
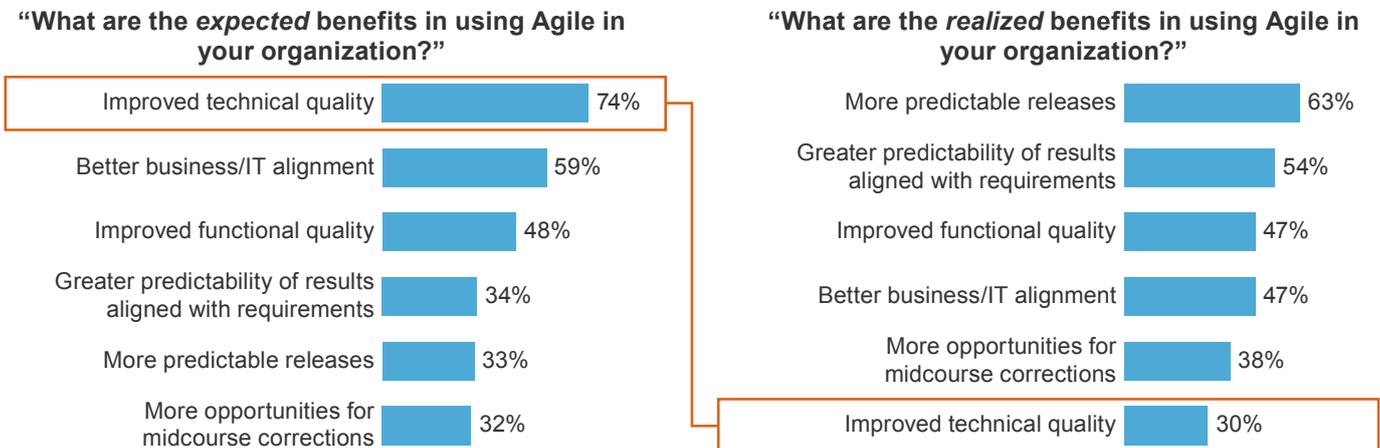
FIGURE 3
Application Development And Delivery Leaders Face Unprecedented Demand For Speed And Quality
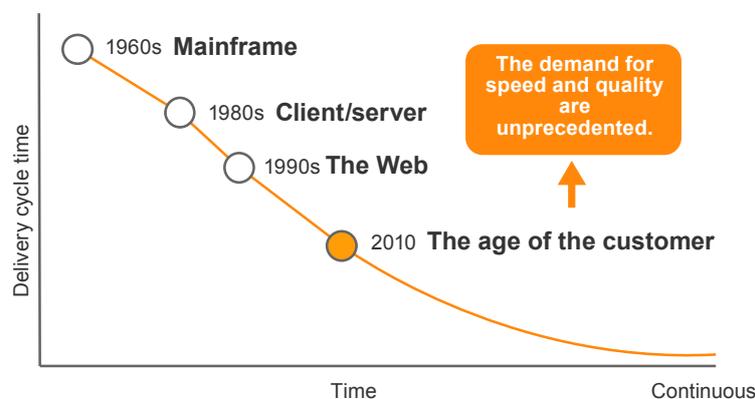
Source: Forrester Research, Inc.

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FIGURE 4
Expected Benefits Of Agile Are Not Being Fully Realized

"What are the *expected* benefits in using Agile in your organization?"

Improved technical quality	74%
Better business/IT alignment	59%
Improved functional quality	48%
Greater predictability of results aligned with requirements	34%
More predictable releases	33%
More opportunities for midcourse corrections	32%

"What are the *realized* benefits in using Agile in your organization?"

More predictable releases	63%
Greater predictability of results aligned with requirements	54%
Improved functional quality	47%
Better business/IT alignment	47%
More opportunities for midcourse corrections	38%
Improved technical quality	30%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015

› **Enable more predictable releases.** Organizations revealed that they actually realized unexpected benefits of Agile being a framework that can improve predictability. IT often has been accused of being unreliable in predicting delivery dates. Agile has enabled IT organizations to gain the trust of business leaders. Our research showed that only a third of respondents expected more predictable releases to be a benefit, while 63% highlighted this as a main benefit of using Agile.

A NUMBER OF CHALLENGES INHIBIT AGILE ADOPTION

Survey respondents highlighted various barriers in adopting Agile. These ranged across all different stages of the application development cycle — both upstream and downstream (see Figure 5).[4] IT and business leaders highlighted that the largest barriers to adopting more Agile in their delivery process are:
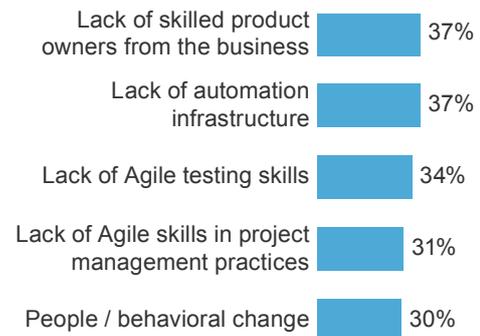
› **Lack of skilled product owners.** Over a third (37%) of respondents indicated that the lack of skilled product owners (PO) from the business is a barrier to adopting more Agile. Ensuring that new applications deliver their full value requires the business to be closely involved across all stages of the application development life cycle. POs must have the right skills to support the application delivery process through a new process in setting business requirements called minimum viable product.[5] Our survey also highlighted that product owners are hard to find within the business (52% face this challenge), and the business lack ownership of application development activities (35%) (see Figure 6).

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› **Lack of automation infrastructure.** A further 37% also highlighted a lack of automation infrastructure as a barrier to adopting more Agile in their application delivery process. Only 3% of respondents stated that they are able to automate more than 80% of their test cases to improve application delivery cycles. Automation allows for organizations to continuously develop applications to ensure they meet the evolving needs of customers and employees.

› **Lack of Agile testing skills.** Thirty-four percent of respondents indicated a lack of Agile testing skills as a barrier to adopting more Agile in their application delivery process. Too much manual testing leads to increases in testing times and poorer quality. Today's testing strategies and plans are too prescriptive and rigid, and all test cases are planned and specified upfront. But in reality, requirements change often and IT needs to iterate changes as soon as new requirements emerge. Organizations lack the skills required to deliver this iterative/Agile approach required for modern applications.

› **People / behavioral change.** Thirty percent of respondents also identified people / behavioral change as a barrier to adopting more Agile in their delivery processes. Adopting Agile values and principals requires a new culture of adaptation and learning. Organizations often fail to address the gap between the current company culture and the culture that Agile promotes. Different line-of-business priorities can inhibit the adoption of Agile processes. For example, the Lean principle "respect people" centers on rewarding those who add value by upgrading their skills through training and apprenticeships. HR and other lines of business must be aligned to support the adoption of such a large-scale training program in order to fully realize the benefit of such Agile initiatives.

FIGURE 5

Lack Of Skilled Product Owners Is A Barrier To Adopting Agile

"Which of the following do you see as barriers to adopting more Agile in your delivery process?"

Lack of skilled product owners from the business — 37%

Lack of automation infrastructure — 37%

Lack of Agile testing skills — 34%

Lack of Agile skills in project management practices — 31%

People / behavioral change — 30%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015

FIGURE 6

Skilled Product Owners Are A Rare Commodity

"What challenges do you face in getting product owners involved in the application development life cycle?"

They are hard to find in the business and to hire from the outside world — 52%

Business product owners are not skilled enough on concepts like MVP, smaller batch requests, etc. — 38%

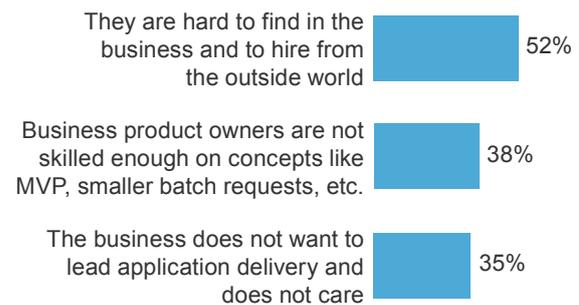The business does not want to lead application delivery and does not care — 35%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015
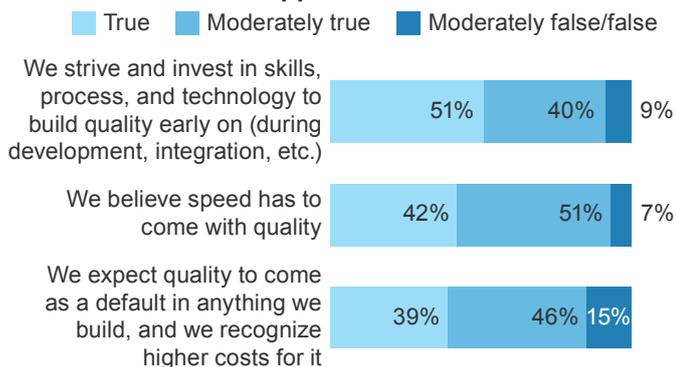
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Adopt An "Agile All The Way Through" Approach To Keep Up With User Demands

In the early days, organizations were mostly focusing on the upstream of the application delivery process as well as project management. This has resulted in a high adoption of Scrum.[6] However, this has only solved half of the problem, as it has helped debunk the walls between business and development teams but not the walls between development and operations and everything in between, including testing (Agile in the downstream of the delivery process or DevTestOps). It's "Agile all the way through" that helps truly reap the best business benefits in becoming Agile, enabling true business agility. For leading organizations that have achieved this, it means that development, testing, and delivery become a continuous and automated process. In the research, we found out that organizations are stepping up to the challenge, with over 90% of respondents claiming they must invest in the skills, processes, and technology to build a modern application delivery organization (see Figure 7).

FIGURE 7
Organizations Must Invest In Skills To Truly Reap The Benefits Of Agile

"For each of the below, how true is the statement about how your department considers investments in obtaining higher levels of technical quality in applications?"

True   Moderately true   Moderately false/false

We strive and invest in skills, process, and technology to build quality early on (during development, integration, etc.)   51%   40%   9%

We believe speed has to come with quality   42%   51%   7%

We expect quality to come as a default in anything we build, and we recognize higher costs for it   39%   46%   15%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015
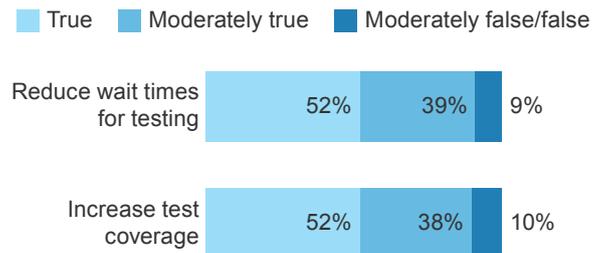
ORGANIZATIONS MUST BECOME TEST OBSESSED TO DELIVER QUALITY AT SPEED

As software increasingly becomes part of an organization's brand, the need for better testing is paramount to the organization's ability to deliver customer-focused, high-quality applications at speed. So what are the current barriers to testing quality at speed? More than half of respondents identified reduced waiting times for testing and increased test coverage across all stages of the software development life cycle as the biggest barriers (see Figure 8).

FIGURE 8
Almost All Respondents Understand The Need For Faster Testing

"Which of the following statements are true regarding your needs for application development and delivery?"

True   Moderately true   Moderately false/false

Reduce wait times for testing   52%   39%   9%

Increase test coverage   52%   38%   10%

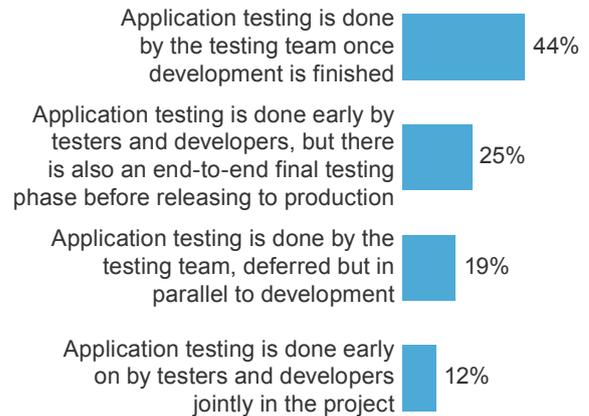Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015

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But today, testing in many organizations is still an afterthought. More than 40% of our respondents indicated that they test once the application has been finished (see Figure 9). While this has never really worked well even in waterfall, it is totally inadequate and unacceptable for Agile development. A proper Agile setup is impossible if testers and developers are not working together in one integrated process, team, and space.

To succeed with Agile development, IT leaders must scrutinize their Agile testing strategy. Quality assurance and testing need to mature to become more Agile to ensure modern systems of engagements are delivered rapidly without defects. While we expect the number to grow, only 12% of organizations today perform application testing early on by both testers and developers as a joint project. These leading Agile organizations are able to gain the full benefits of Agile as they execute all testing — functional and nonfunctional — within each sprint and automate as much of it as possible (see Figure 10). [7]

FIGURE 9

Application Testing Is An Afterthought

"How is testing done when developing modern applications or systems of engagement?"

Application testing is done by the testing team once development is finished — 44%

Application testing is done early by testers and developers, but there is also an end-to-end final testing phase before releasing to production — 25%

Application testing is done by the testing team, deferred but in parallel to development — 19%

Application testing is done early on by testers and developers jointly in the project — 12%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015

FIGURE 10

All Testing Activities Should Be Progressive, Iterative, And Fully Integrated With Development
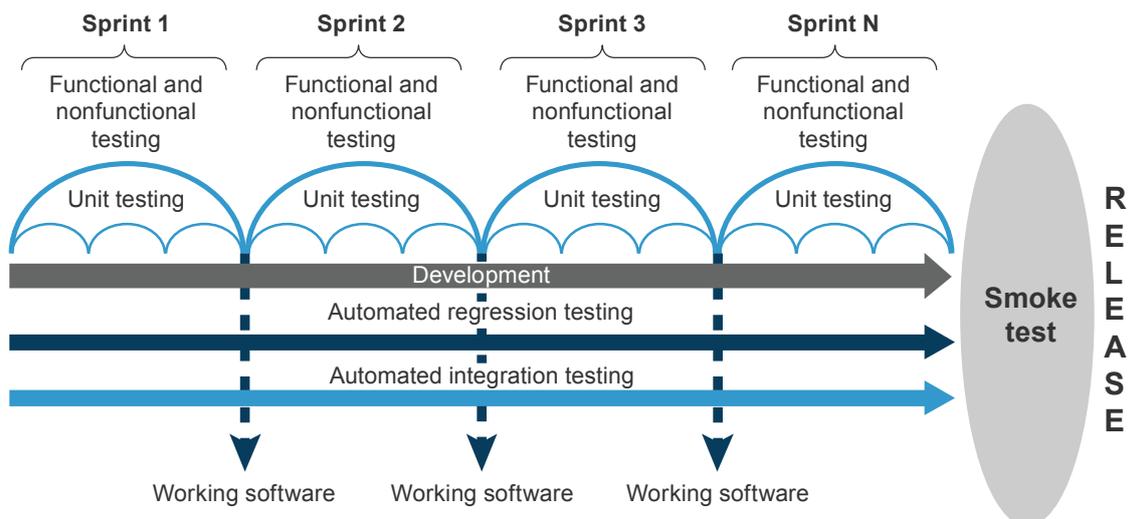
Source: Forrester Research, Inc.

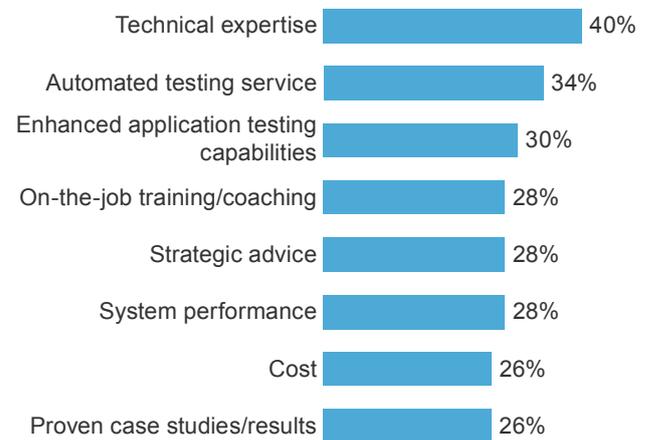## Agile Co-Sourcing Might Be Your Best Option To Speed Agility

Adopting Agile processes through the software development life cycle and scaling them within your enterprise is no easy task. In fact, almost 40% of respondents agreed that they are increasingly looking for external partners to improve quality of application development and integration. When considering partners, organizations look to fill gaps in their skills or build trusted partnerships to co-source jointly. Partners are required to help with testing in the following areas (see Figure 11):

› **Technical expertise.** Forty-percent of respondents seek partners that can provide the technical expertise to support their application development and testing needs. Organizations will look to partners to build quality code and minimize defects in testing and, more importantly, later in production.

› **Automated testing.** Over a third of organizations seek providers that can offer automated testing services. Agile demands more automated testing, which is already difficult and expensive. Organizations need to turn large batteries of manual regression tests into automated tests that can run over and over in a fraction of the time. Organizations expect partners to provide a collaborative environment for teams to define what can be automated and to fully utilize their existing tool investments.

› **Application testing capabilities.** Thirty-percent of respondents seek partners that offer enhanced testing capabilities. As automation becomes more of a technical demand on testers, new practices such as test-driven development or exploratory testing become the norm, and organizations look for these skills in external partners. Organizations are looking to leverage partners' application testing capabilities as an extension of their team to ensure application testing is delivered efficiently through a federated testing organization: a centralized practice testing center that supports all delivery teams and provides patterns, tools, and testing methodologies and has testers on the Agile teams that execute Agile testing at the project level.

Providing a full-scale dev test team service. Not all clients have internal design and development skills, but they still want to build differentiating business solutions for their business and customers. Providing they allocate a strong business product owner, partners can assign a full Scrum or development test team to deliver new features continuously on demand.

FIGURE 11

Application Development Partners Must Provide Technical Expertise And Automated Testing Services

"Please select your top *three* criteria for selecting a service provider to support application development and testing needs."

Criteria	Percentage
Technical expertise	40%
Automated testing service	34%
Enhanced application testing capabilities	30%
On-the-job training/coaching	28%
Strategic advice	28%
System performance	28%
Cost	26%
Proven case studies/results	26%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015

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Key Recommendations

Whether you are already being digitally disrupted or on your digital transformation journey, business leaders will soon, if they haven't already, come knocking on the door for greater and faster software delivery capabilities. The impact on how IT organizes its resources, the SDLC, overall testing, and deployment will be huge. Whether you have started the journey to Agile or plan to do so soon, you will have to become really good at it, because at some point you will need to scale Agile across even more projects and throughout the organization. That's where most of your peers are at. Prepare now, and don't defer this any further:

› **Adopt Agile in the upstream and in the downstream.** Like many organizations, you might have focused the adoption of Agile on the project/management aspects of Agile (upstream) that are usually done by adopting Scrum. But to successfully deliver on a fast response base, you must build a continuous software delivery pipeline and adopt Agile all the way through to operations in order to deliver continuously. Forrester believes testing is a crucial capability in applying Agile all the way through, and it must become a first-class citizen in the whole process, from development through to operations. Forrester calls this DevTestOps.

› **Apply five *must-do's* to get application testing up to scratch.** Adopt five key best practices for improving testing capabilities to support agile.[8] These include: 1) organize testing in a lean way; get rid of unnecessary testing process that do not contribute to quality, and be more explorative and focus on risk; 2) use shift-left and shift-right testing — build in quality right from the beginning of the development cycle but also give your developers data on how apps perform in production, providing user feedback; 3) build a practice for testing skills, providing specialized testing resources and enabling a culture that supports the dissemination of best practices across the testing practice; 4) reduce manual testing in favor of automation — automate as much of the SDLC as you can, from test definitions/design to implementation/execution; and 5) automate test data and test environment provisioning.

› **Transform to embrace more Agile processes.** Whether you decide to embark on your Agile journey on your own or look externally for help, your organization must transform to support more Agile adoption. From the top to the bottom, your organization needs to fully understand and embrace Agile values and principles. This means that IT leaders need to get executive commitment to embrace Agile and lean thinking across all spectrums of the business. IT leaders should also look to appoint business product owners with strong leadership, business knowledge, and communication and negotiation skills, in all their Agile projects.

› **Identify what in your application portfolio to apply Agile to first.** Agile techniques are not one size fits all. Any successful Agile development process has been tailored to suit the business requirement at a specific moment in time. IT leaders should identify where in the application portfolio Agile is required. Systems of engagements — typically mobile or web applications that have a direct impact on the overall customer experience — are most likely to require the attention of Agile in the short term, as they require quick and high-quality delivery of software to allow the business to meet customers' needs.

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Appendix A: Methodology

In this study, Forrester conducted an online survey of 100 IT and decision-makers at organizations in US to evaluate the current state of application development approaches. Questions provided to the participants asked about the main demands being placed on application development by business leaders, the impact of lengthy development cycles, the role of testing in modern application development, the Agile development approaches used today, and the key criteria that organizations look at when selecting a partner. The study was completed in March 2015.

Appendix B: Supplemental Material

RELATED FORRESTER RESEARCH

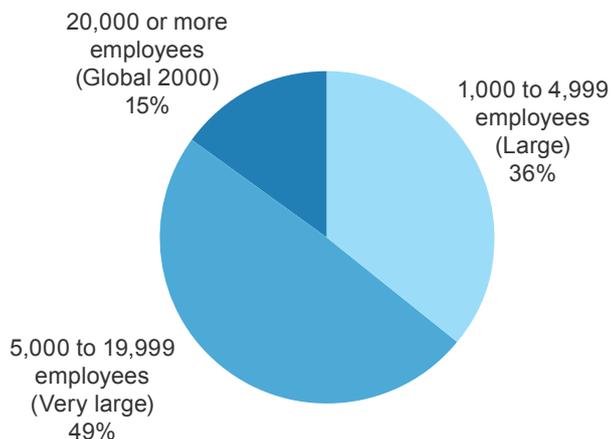"TechRadar™: Continuous Software Delivery, Q2 2015," Forrester Research, Inc., May 1, 2015

"Five Must-Do's For Testing Quality At Speed," Forrester Research, Inc., January 23, 2015

"Brief: Agile Development And Customer Experience — A Marriage Made In Heaven," Forrester Research, Inc., October 9, 2014
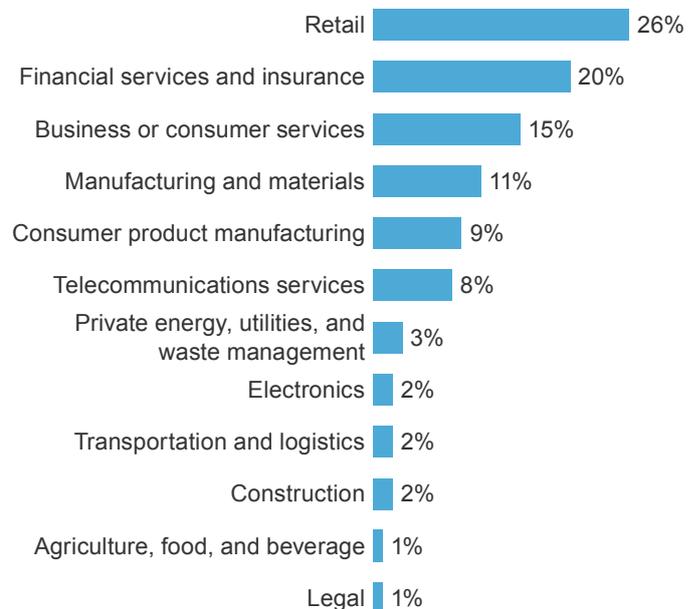
Appendix C: Demographics/Data

FIGURE 12
Survey Demographics: Employee Size And Industry

"Using your best estimate, how many employees work for your firm/organization worldwide?"

- 20,000 or more employees (Global 2000) 15%
- 1,000 to 4,999 employees (Large) 36%
- 5,000 to 19,999 employees (Very large) 49%

"Which of the following best describes the industry to which your company belongs?"

Industry	Percent
Retail	26%
Financial services and insurance	20%
Business or consumer services	15%
Manufacturing and materials	11%
Consumer product manufacturing	9%
Telecommunications services	8%
Private energy, utilities, and waste management	3%
Electronics	2%
Transportation and logistics	2%
Construction	2%
Agriculture, food, and beverage	1%
Legal	1%

Base: 100 US IT and business decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Magenic, March 2015

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Appendix D: Endnotes

[1] Definition: Systems of engagement are applications that aggregate information from multiple service endpoints, package that information into a contextual bundle, and enable customers to take the most appropriate action. Systems of engagement are most typically mobile or web applications, but they also work in people-mediated settings like call centers or sales force support, where agents or salespeople deliver the systems' recommendations and actions on behalf of customers. Source: "Brief: Systems Of Engagement Take Center Stage," Forrester Research, Inc., May 16, 2014.

[2] The speed of application delivery has a huge impact on the business and, as a result, is shrinking from months to weeks. Source: "Five Must-Do's For Testing Quality At Speed," Forrester Research, Inc., January 23, 2015.

[3] Source: "Five Must-Do's For Testing Quality At Speed," Forrester Research, Inc., January 23, 2015.

[4] Upstream as referred to here would mean adopting Scrum, MVP for requirements prioritization, and other Agile PM-related practices. The downstream side looks more to engineering steps like testing, test-driven development (TDD), and continuous integration and development.

[5] MVP comes from Lean management. Eric Ries, who wrote the New York Times bestseller *The Lean Startup*, defines a "minimum viable product" as one that has enough features (and no more) that allows shipping a product that resonates with early adopters, some of whom will pay money or give feedback. WIP is also a Lean process concept, while throughput time (TPT) is the time before a product emerges from a particular production facility, once it is entered there. Source: "How Can You Scale Your Agile Adoption?" Forrester Research, Inc., February 5, 2014.

[6] Source: Forrester's Q2 2015 Global Agile Adoption Online Survey

[7] Some organizations fake Agile testing by alternating development sprints with testing sprints using separate development and testing teams. Some have obtained shorter release cycles with this approach, but it's not sustainable. It perpetuates mini-waterfall behaviors: Testing falls to the end of the cycle, there is less collaboration between developers and testers, and it delays feedback loops among stakeholders, all of which does little to ensure good quality or faster delivery. To gain the full benefits of Agile, first-class Agile organizations execute all testing — functional and nonfunctional alike — within each sprint. Source: "Consistent Performance In Agile Teams Must Include Testing," Forrester Research Inc., January 15, 2013.

[8] Source: "Five Must-Do's For Testing Quality At Speed," Forrester Research, Inc., January 23, 2015.

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