

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

by Diego Lo Giudice and Kurt Bittner

January 7, 2016

Why Read This Report

Customers' growing expectations and increased competition mean application delivery leaders need to speed and scale their delivery across the board. Many leaders know that they need to improve but struggle with what to do and where to start. Different teams face different challenges, but the patterns are consistent across organizations. Forrester's modern application delivery (MAD) assessment model helps application development leaders find the gaps — and systematically and continuously reduce them.

This is an update of a previously published report; Forrester reviews and updates it periodically for continued relevance and accuracy.

Key Takeaways

Faster Delivery Improves Customer Experience

Applications are often the first touchpoint of a customer experience (CX); therefore, linking software delivery efforts directly to CX has a direct impact on clients. But to improve CX more deeply, you will need to create new business processes while re-engineering and digitizing old ones.

Systematically Remove Software Delivery Barriers To Improve Strategic Performance

To delight customers, you must act as if you were running a software company. To do so: 1) Use “product teams” to align business, team, and organization goals; 2) simplify roles and broaden people skills to improve operational results; 3) adopt Lean and Agile practices to improve delivery results; and 4) automate to simplify the transition.

Use Forrester's MAD Assessment Model For Continuous Improvement

Forrester's MAD assessment model provides a set of questions to assess value streams, score where you currently stand, and identify where to focus improvement efforts. Use the assessment at each complete iteration of the four steps of your continuous improvement cycle: identify, change, deliver, and measure.

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

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Table Of Contents

2 To Deliver Superior Customer Value, Take A Different Approach

Taking An Outside-In View Creates A Greater Connection With Customers

Aligning Business Processes With Value Delivery Improves Results

4 Assess Systemic Application Delivery Barriers To Improve Performance

Overcome Business Alignment Barriers By Shifting To “Product Teams”

Overcome Organizational Barriers By Simplifying Roles And Broadening People Skills

Overcome Operational Delivery Barriers By Adopting Lean And Agile Practices

Overcome Technology Barriers Through Automation, Tools, And Architecture

Recommendations

10 Use The MAD Assessment Model To Improve Your Strategy/Road Map

11 Supplemental Material

Notes & Resources

Forrester interviewed 17 vendor and user companies, including CA Technologies, CI&T, CollabNet, Electric Cloud, EPAM Systems, General Electric, HP Enterprise, IBM, NIIT Technologies, Parasoft, People10 Technologies, Philips, Qualitia, Tech Mahindra, ThoughtWorks, Tricentis, and VersionOne.

Related Research Documents

[Agile And DevOps Adoption Drives Digital Business Success](#)

[Define A Software Delivery Strategy For Business Innovation](#)

[Self-Assess Your Modern Application Delivery Capabilities](#)

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How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

To Deliver Superior Customer Value, Take A Different Approach

Application development and delivery (AD&D) leaders need to link their application delivery efforts more directly to the needs of the business and their customers. In our bi-annual survey on Agile and Lean, 83% of the 151 software professionals surveyed told us that they expect better tech management and business alignment to result from adopting Agile approaches.¹ In reality, to deliver superior customer outcomes, you must do more than simply change your software delivery life-cycle approach: You must aim for a broader business transformation that goes beyond this.

Taking An Outside-In View Creates A Greater Connection With Customers

Applications are often a business' primary touchpoint with its customers; business processes, communications, and applications need to align to deliver delightful customer experiences. CX practices aim to maximize the experiences of perpetually connected customers across their entire journey: discover, explore, buy, and engage.² Many of those touchpoints today are manual, but more are becoming digital and will depend on new or enhanced software. Improving the customer experience means that AD&D teams need to:

- › **Take an outside-in perspective.** Focus on the whole customer experience, including business processes and applications. View everything from the customer's perspective. AD&D pros traditionally think "inside-out"; they look at what they can deliver first and at real customers' needs second (if at all). "Outside-in" places customers at the center of attention and delivers what they need, which is not always what they initially want (or what they ask for). In fact, they often don't quite know or can't quite express what they need. The highly effective DevOps teams we've seen at client organizations focus clearly on being outside-in.³
- › **Focus on unmet needs to uncover business opportunities.** Traditional requirements approaches often lose their "why"; they focus too much on features and not enough on the outcomes that users are trying to achieve. Find new opportunities to better serve your customers by focusing on their unmet outcomes and those that show large gaps between their current level of satisfaction and what they really want.⁴
- › **Create a customer feedback loop to guide innovation.** Organizations deploying mobile and cloud applications are using techniques like A/B testing to evaluate the relative benefits of different solutions. A/B testing enables you to gather real-time, direct feedback from real users and provides a way to validate assumptions and hypotheses. This supports rapid software delivery and enables AD&D teams to explore innovative alternatives.

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

Aligning Business Processes With Value Delivery Improves Results

Improving CX and business results is not just a matter of upgrading a website or improving a mobile application. While that certainly improves the customer experience in those touchpoints, for more pervasive improvement of the entire customer journey, software and business leaders need to adapt, re-engineer, and digitize old processes to increasingly focus delivery on providing greater value. The onus is on AD&D leaders, and their peers, to:

- › **Build consensus about the opportunity across all parts of the organization.** Identify who in the organization is responsible for delivering a desired business outcome by identifying the processes and people that are core to delivering value for each value stream. Before you can digitize business processes, you must tightly align them in an end-to-end value stream.⁵ You need consensus among all members of the value stream, including the key roles from the core Agile teams that support it. In our 2015 Agile survey, 90% of respondents agreed that the core team should include developers; business product owners (88%), Scrum masters (84%), and testers (82%) were also key. Other important roles that were included less frequently were enterprise architects (59%), project managers (48%), and UX design professionals (46%).⁶
- › **Adapt funding models to deal with evolving customer needs.** Most of the current funding models are exactly the opposite of what modern application delivery organizations need; they need budgeting and funds that dynamically adjust and align to changing needs.⁷ These new funding models need to enable an environment where small tasks get done in parallel, with an emphasis on speed, flexibility, autonomy, and high tolerance for small failures. Single and yearly budgeting cycles won't cut it; instead, you need to fine-tune budgets during the course of the year. Look to case studies like that of Blue Cross Blue Shield of Nebraska, which transformed its technology planning and delivery by making it more dynamic and evolutionary.⁸
- › **Align governance to ensure consistent value delivery.** Traditional governance focuses mainly on ensuring that projects are on schedule and in scope, with a yearly fixed budgeting cycle. This is a source of trouble; it's why business units think about IT and software delivery as a cost structure to control rather than a value delivery organization to partner with. Successful organizations shift governance to focus on optimizing the value delivered for the business; they put the business in the driver's seat of projects with the objective of prioritizing a minimum viable product that addresses customer needs and business priorities. Value becomes a top-level metric, with quality and velocity, when measuring consistent delivery.⁹
- › **Streamline business processes to optimize value delivery.** To improve or, in some cases, transform customer experiences to become more digital, applications can't be just an "extra add-on" to existing processes. They have to be integral to a new way of doing business, supporting new processes and changing existing ones. In Forrester's Customer Experience Index (CX Index™), companies boosted their CX Index score by not only improving their websites and mobile apps but also automating their phone systems, call centers, and written communications. More importantly, they also improved processes with better tools for the frontline employees who staff these channels.¹⁰

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

Assess Systemic Application Delivery Barriers To Improve Performance

A good strategy for improving application delivery for CX is to know where you are starting from and where the challenging barriers are. Forrester's modern application delivery (MAD) assessment model provides a set of questions that allows you to assess, score, and identify where to focus your improvement efforts (see Figure 1).¹¹ Forrester's model assesses four key areas of alignment:

1. **Business alignment.** Assess business alignment both ways: outside-in and inside-out. Your goal is to identify how outside-in your current application landscape is, how well it aligns with the needs of business stakeholders and customers, and how it has evolved over time to meet changing needs (at a reasonable cost). The assessment also checks if your delivery model incorporates business and customer feedback fast enough. It also touches on alignment with business strategy, change enablement, and your focus on business value delivery. A score between 4 and 5 means your organization has strong business alignment, has great capabilities, and uses customer analytics.
2. **Organizational alignment.** Our model assumes that leadership is key; it also looks at the involvement of business and external stakeholders and whether or not extended and cross-functional teams have all the necessary skills and roles to get the job done fast. Effective change management involves embedding it in a daily process so that it receives daily attention, as well as investing in skills and collaborative roles. Some 71% of decision-makers in our recent Agile survey told us that one of Agile's most valuable benefits is the flexibility it affords them to make these kinds of mid-course corrections.¹² A score between 4 and 5 means your organization has strong capabilities and mindset, appropriate change management, excellent skills, a Lean organization, and advanced Agile practices to support continuous business delivery.
3. **Delivery process alignment.** Companies need to adopt best practices for application delivery and Lean processes — from gathering requirements to design-development-testing to environment provisioning and to integration, deployment, and operations. The rapid delivery cycles that these practices enable give organizations the ability to closely connect the customer experience with business results.¹³ A score between 4 and 5 probably means your organization has adopted Lean processes and Agile practices both upstream and downstream in the delivery life cycle.
4. **Technology alignment.** The technology section of our model involves a light assessment of the tools you use across the end-to-end life cycle — from portfolio management to work management, source code and configuration management, and testing and release automation.¹⁴ We also suggest that you check architecture decoupling, which is crucial for agility.¹⁵ A score between 4 and 5 suggests that your organization makes adequate use of the necessary tools and technology as well as using Lean governance and decoupling in your architecture.

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

FIGURE 1 Understand Your Business, Organization, Delivery Process, And Technology Alignments

Business alignment	
Average score on a scale of 1 (poor) to 5 (outstanding)	
Outside-in	<input type="text"/>
Inside-out (enabling)	<input type="text"/>
Value-driven	<input type="text"/>
Average business alignment score <input type="text"/>	
What it means	
Little focus on sound business-related objectives is evident. Odds of success are low.	1-2.9
Some alignment to business objectives; some use of customer analytics practices. Improvement opportunities are evident in some areas.	3-3.9
Strong business objectives alignment, capabilities, and use of customer analytics practices. Chances of success are high.	4-5

Organization alignment	
Average score on a scale of 1 (poor) to 5 (outstanding)	
Leadership	<input type="text"/>
Business and external stakeholders	<input type="text"/>
Teaming	<input type="text"/>
Change management	<input type="text"/>
Skills and roles	<input type="text"/>
Organization alignment average score <input type="text"/>	
What it means	
Little mindset, organization, and skills typical of Lean and Agile organizations are evident. Odds of success are low.	1-2.9
There are some good signs of appropriate mindset, capabilities, and skills of people from top to bottom. Improvement opportunities are evident in some areas.	3-3.9
Strong capabilities and mindset, appropriate change management, skills, and organization. Agile and Lean practices to support continuous business delivery are consistently present. Chances of success are high.	4-5

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

FIGURE 1 Understand Your Business, Organization, Delivery Process, And Technology Alignments (Cont.)**Operational alignment****Average score on a scale of
1 (poor) to 5 (outstanding)**

Process and requirements	<input type="text"/>
Design-develop-test	<input type="text"/>
Integration environments	<input type="text"/>
Measurement	<input type="text"/>
Operational alignment score	<input type="text"/>

What it means

Little use of best practices is evident. Odds of success are low.	1-2.9
Some use of strategy and alignment with best practices. Improvement opportunities are evident in some areas.	3-3.9
Strong capabilities and use of strategy and alignment with best practices. Chances of success are high.	4-5

Technology alignment**Average score on a scale of
1 (poor) to 5 (outstanding)**

Tools	<input type="text"/>
Architecture	<input type="text"/>
Technology alignment score	<input type="text"/>

What it means

Little use of adequate tools and technology is evident. Odds of success are low.	1-2.9
Some use of adequate tools and technologies. Improvement opportunities are evident in some areas.	3-3.9
Strong use of adequate tools and technology is evident. Chances of success are high.	4-5

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

Overcome Business Alignment Barriers By Shifting To “Product Teams”

High-performing organizations have shifted to using “product-centric” development teams.¹⁶ Their key characteristics are partnering with customers and business stakeholders and owning the business results that their software delivers. Product teams increase the alignment of business, team, and organization goals. AD&D leaders should:

- › **Connect delivery to business value to reduce waste.** Focusing on doing the right things rather than just doing things right ensures that you don’t expend effort on the wrong features for customers. Teams are more motivated because they feel more connected to business results.
- › **Implement greater delivery discipline to produce higher-quality applications.** Doing the right things and doing things right produce better results. Shorter delivery cycles, Agile principles, continuous integration, and automated testing improve application quality.
- › **Ensure product teams stay together, release after release.** Cross-functional teams should stick together for longer — at least 12 to 18 months. Team members who know each other and work together for long periods dramatically reduce communication problems, augmenting delivery speed and predictability. Having everyone involved in a decision in the room helps maintain cadence and speed. Dynamically extend core teams on an as-needed basis.
- › **Link behavioral change to objectives to help continuous improvement.** Change should not be a separate goal and process or it will keep being ignored in favor of more operational day-to-day goals. Change developers’ mindset about writing better code from the beginning via daily integration, automatic unit testing, and automatically reverting when bugs are found; build quality in by writing well-designed unit tests. Tackle broader change through coaching, just-in-time training, and leader-led transformation programs.

Overcome Organizational Barriers By Simplifying Roles And Broadening People Skills

Software development is highly skilled work, not an automated assembly line. People with great skills make a difference. Shorter delivery cycles also encourage new ways of collaboration. AD&D leaders should:

- › **Eliminate role silos and reduce handoffs.** Silos and handovers slow down throughput, creating idle moments via lengthy ad hoc meetings or because one party is on holiday, busy, or late with another task. This often causes work in process or lead time to be longer than it should be. Increasing collaboration and interaction among team members to address this issue is one of the commandments of the Agile Manifesto.¹⁷
- › **Build new skills where needed.** Now that every company is becoming a software company, software development skills are in exceptional demand; they are among the top three skills needed in the industry. To improve capacity in cross-functional teams, your people development plans

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

should have two objectives for each employee: 1) to develop a primary, in-depth skill, such as requirements analysis, design, architecture, development, or testing; and 2) to develop a more general set of skills on top so that they can contribute to any step in the process when needed.

- › **Eliminate management layers by empowering teams.** Self-managed teams were popular in manufacturing in the late 1980s and early 1990s; teams organized their own work, while managers eliminated impediments and enabled autonomy.¹⁸ Agile and Lean encourage a similar approach, driving ownership and delivery at the project team level. Self-management works as long as you clearly assign accountability and focus on meeting business objectives, rather than trying to make self-management work. Self-management can create greater motivation among teams, driving them to deliver work faster and better and with more focus on improving the customer experience.

Overcome Operational Delivery Barriers By Adopting Lean And Agile Practices

Our MAD assessment model looks at how well you are adopting Agile and Lean practices. The first step in any transformation is to understand deeply the values and principles of Agile and Lean. Successful AD&D leaders adopt a core set of practices when scaling Agile that align with the desired business outcomes:

- › **Fast feedback leads to better requirements and results.** Requirements continue to be the weak link in the application delivery pipeline. Requirements workshops with teams and subject matter experts are a poor substitute for direct feedback from real customers. Faster delivery, feedback loops, and application analytics enable organizations to innovate and experiment with different solutions, making decisions based on real data rather than the personal opinions of internal stakeholders.¹⁹
- › **Continuous value delivery engages the business and customers more.** When product owners from the business lead team efforts, delivery teams are more aware of what is important and valuable to the business in every sprint, feature, and user story they deliver. AD&D leaders at B2C firms can get concrete and immediate feedback by designing systems of engagement to collect real-time data while customers are actually using these systems in production. Analyzing this customer-generated data will help set a better direction for the delivery team.
- › **Measuring cycle time shifts the focus to value.** *Cycle* time, a concept borrowed from Lean Manufacturing, helps identify where you generate value — and waste — in your core processes. For example, when *lead* time (a submetric of *cycle* time) increases, you're generating waste; if it decreases, you are either increasing *throughput* or optimizing your *process* time to deliver value faster. A combination of cycle time metrics helps link your improvements to business value.²⁰

Overcome Technology Barriers Through Automation, Tools, And Architecture

Last, but not least, the right technology and tools make a difference when scaling fast delivery capabilities at divisional or enterprise levels. We describe the various tool categories in the landscape report of this playbook.²¹ Our assessment model emphasizes a focus on:

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

- › **Provisioning Agile PM and development tools and resources to speed initiation.** Whether at an enterprise, divisional, or team level, teams need project management (PM), source control, versioning, test environments, and other foundational tools for rapid development. Managing a heterogeneous environment at the enterprise level is hard and expensive, and it can distract from a focus on business delivery. CollabNet focuses on solving many of these Agile-at-scale issues as well as enabling heterogeneous tool consolidation and standardization with its TeamForge ALM products. Atlassian, CA Technologies' Rally, and VersionOne provide enterprise-level Agile PM support.
- › **Shifting testing "left" to enable continuous testing.** Left-shift testing is not a new concept. However, shorter delivery cycles and more agility mean that it's no longer a nice-to-have, but a must-have. QA testers need to get involved at project kickoff; unit testing has to be automated and run with every single build; regression tests must be executed iteratively; and integration testing needs to be done as soon as possible in early sprints. Quality becomes a problem for everyone on the team, not the responsibility of a third party that you can blame. New testing tools like CA's Test Case Optimizer, Cucumber, HPE Unified Functional Testing, ThoughtWorks' Gauge, and Tricentis' Tosca as well as well-known tools like IBM Rational Test Workbench, Microsoft Visual Studio Test Professional, and Parasoft's Development Testing Tool Platform contribute in different ways to shifting testing to the left.
- › **Automating the build-test-deploy value stream.** It is crucial to build a strong quality system as part of your continuous integration and delivery capability. Successful Agile-at-scale organizations like GE Capital, HP Enterprise (HPE), and Nationwide Insurance did this before even starting to think about scaling. The goal? To guarantee that you can promote and deliver quality software to the next stage at the press of a button. Automation tools and increased collaboration between development and operations teams are crucial here, and the list of potential vendors is long.²²
- › **Automating environment provisioning, including test data.** Environment provisioning for development, testing, and deployment plagues modern application delivery. You can automate it because the process is pretty standard and well-known, but it only works if you put configurations under version control and use automation tools to deploy them. However, provisioning environments consistently is of little help if you don't use proper test data in the test cases and test process. Test data management and service virtualization tools solve this, especially when your application landscape is a complex one with high-scale needs. CA Technologies (Test Case Optimizer, Service Virtualization), HPE (Service Virtualization), IBM (InfoSphere Optim, Green Hat), Informatica, Parasoft (Virtualize), and Tricentis (Tosca) are good examples of vendors and products in this space.²³

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

Recommendations

Use The MAD Assessment Model To Improve Your Strategy/Road Map

AD&D leaders can use the MAD assessment model at the overall organization level; it takes a broad view of continuous delivery concerns and business outcomes that require an organizational focus. However, you can also use this assessment model:

- › **In conjunction with value stream mapping (VSM).** This is a powerful option if you are using or planning to use VSM to identify waste in your software delivery process, as described in the strategic plan report of this playbook.²⁴ In this case, use the assessment model questions to drive interviews during the value stream analysis (or during the Gemba walks in VSM). Score your team to see where you need to improve your software delivery value stream; then leverage the results to drive in-depth conversations around building the as-is VSM. You can also use the VSM charter to see where you might want to run specific assessments.
- › **As a standalone assessment.** Consider using the operational and technology sections at the team level. Individual teams may derive value from using these sections to improve their performance in isolation from organizational concerns. They will find that they can't resolve some issues given their sphere of control, but it may enable them to improve their performance enough to bring organizational constraints to light. Use the business and organization alignment sections to sway executive management. These sections will be of most interest to executives and leaders looking to understand where they are and what they need to change to improve. Technical leaders should be able to assist them with the other sections to provide a more comprehensive view.
- › **Over time to become a continuously improving organization.** Once you have 1) identified problems, 2) enabled change, 3) executed on the delivery, and 4) measured improvement, you need to reassess your process and decide what to improve next. How often you need to run this loop will depend on how big a barrier you have to overcome. At the team level, you can usually run this loop every three to six months. If your scope is broader and at a higher organizational level, it might take six to 12 months before you see improvements and can start the reassessment to identify next steps. To execute on shorter cycles, break larger problems into smaller ones. However, you should aim for a continuous cyclical and iterative improvement process — not a one-off improvement.

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

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Supplemental Material

Companies Interviewed For This Report

CA Technologies

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CollabNet

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EPAM Systems

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HP Enterprise

IBM

NIIT Technologies

Parasoft

People10 Technologies

Philips

Qualitia

Tech Mahindra

ThoughtWorks

Tricentis

VersionOne

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

Endnotes

- ¹ Source: Forrester's Q2 2015 Global Agile Software Application Development Online Survey.
- ² Today's consumer engages through a variety of touchpoints, yet many brands struggle to deliver cross-touchpoint experiences. See the "[Manage The Cross-Touchpoint Customer Journey](#)" Forrester report.
- ³ For Forrester's exposition of the seven main principles of DevOps, see the "[The Seven Habits Of Highly Effective DevOps](#)" Forrester report.
- ⁴ For a view on how desired outcomes and focusing on the gap between important and current satisfaction can drive innovation, check out Anthony Ulwick, *What Customers Want*, McGraw-Hill, 2005.
- ⁵ Value streams and value stream mapping (VSM) are a team-based methodology that you can use to improve modern application software delivery. See the "[Define A Software Delivery Strategy For Business Innovation](#)" Forrester report.
- ⁶ For more on how cross-functional teams are organized, see the "[The 2015 State Of Agile Development: Learn From Agile Expert Firms](#)" Forrester report.
- ⁷ Eric D. Beinhocker describes how most current budgeting models largely depend on old command-and-control models that were designed to solve large, complex problems and that excel at control, efficiency, and accountability in large companies.
- ⁸ For more, see the "[Case Study: Agile Budgeting And Methodology Expand Beyond IT And Deliver](#)" Forrester report.
- ⁹ Agile, Lean, and DevOps shift some of the metrics focus to business outcomes. Measuring value therefore becomes important. See the "[Use Modern Benchmarking For Modern Application Delivery](#)" Forrester report.
- ¹⁰ Forrester interviewed customer experience (CX) professionals at brands that showed the biggest year-over-year improvement in our annual CX benchmark. Forrester asked what they and their companies did to drive CX improvement and how those efforts helped the business succeed. For a summary of the lessons learned from talking to seven of the members of the "most improved" group, see the "[How Companies Improved Their Customer Experience Index Scores, 2014](#)" Forrester report.
- ¹¹ You can download the self-assessment toolkit for modern application delivery capabilities. See the "[Self-Assess Your Modern Application Delivery Capabilities](#)" Forrester report.
- ¹² Source: Forrester's Q2 2015 Global Agile Software Application Development Online Survey. For the full results of the survey, see the "[The 2015 State Of Agile Development](#)" Forrester report.
- ¹³ Agile disrupts everything that we know about testing, including what practices to use, what skills are needed, how to set up the testing organization, and how to leverage testing tools. For more information on how companies are adopting Agile, see the "[Consistent Performance In Agile Teams Must Include Testing](#)" Forrester report.
- ¹⁴ For a description of the automated application delivery pipeline and a breakdown of the categories of tools that make up the pipeline, see the "[TechRadar™: Continuous Software Delivery, Q2 2015](#)" Forrester report.
- ¹⁵ The critical enabler for rapid software releases is a loose coupling of components and services, both within and between applications. For more information on how architecture needs to change when speeding delivery, see the "[Brief: Software Innovation Requires A Loosely-Coupled Application Architecture](#)" Forrester report.
- ¹⁶ AD&D organizational change is in the wind in most enterprises, guided by four ideas: know when to build products, not projects; rely on cross-discipline, domain-expert teams; build only unique value and broker the rest; and do less, delegate more. AD&D professionals: Read this report, part of the application development strategy, structure, and sourcing playbook, to learn the three new models emerging for organizing enterprise AD&D groups. See the "[Reforming AD&D Organizations For Customer Obsession: The Three Models](#)" Forrester report.

How To Build Better Software, Faster

Assessment: The Modern Application Delivery Playbook

- ¹⁷ The Agile manifesto was created by 10 of the best software gurus. Source: Kent Beck, Mike Beedle, Arie van Bennekum, Alistair Cockburn, Ward Cunningham, Martin Fowler, James Grenning, Jim Highsmith, Andrew Hunt, Ron Jeffries, Jon Kern, Brian Marick, Robert C. Martin, Steve Mellor, Ken Schwaber, Jeff Sutherland, and Dave Thomas, “Manifesto for Agile Software Development,” The Agile Manifesto (<http://www.agilemanifesto.org/>).
- ¹⁸ Modern organizations break down functional fiefdoms, eliminating unnecessary handoffs and streamlining their delivery approach. For more on how organizations need to change and operate in the modern application delivery era, see the “[Modern Application Delivery Demands A Modern Organization](#)” Forrester report.
- ¹⁹ Requirements in the form of customer feedback provide more direct and clear input into what customers need. See the “[Brief: Software Requirements Practices Are Ripe For Disruption](#)” Forrester report.
- ²⁰ AD&D leaders are using a new set of metrics that help them monitor and improve the value they deliver, based on feedback from business partners and customers. In this report, we highlight these new metrics that connect business outcomes to app delivery performance — as well as the practices and tools that modern application delivery teams and their AD&D leaders use to collect and report them. See the “[Build The Right Things Better And Faster With Modern Application Delivery Metrics](#)” Forrester report.
- ²¹ The modern application delivery cycle has a foundational process that includes environment management, work-in-process management, resource allocation, versioning, and change management. See the “[Navigate The Modern Application Delivery Landscape](#)” Forrester report.
- ²² Atlassian, CA Technologies, Chef, Electric Cloud, IBM, Microsoft, Puppet, and Serena Software are among the usual suspects here. For more on the practices of continuous delivery, see the “[The Eight Tenets Of Faster Application Delivery](#)” Forrester report.
- ²³ For more on service virtualization vendors, see the “[The Forrester Wave™: Service Virtualization And Testing Solutions, Q1 2014](#)” Forrester report.
- For more on the test data management vendor landscape, see the “[Vendor Landscape: Enterprise Test Data Management](#)” Forrester report.
- ²⁴ We describe value stream mapping in the strategic plan module of the modern application delivery playbook. See the “[Define A Software Delivery Strategy For Business Innovation](#)” Forrester report.

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