

Faster Software Delivery Will Accelerate Digital Transformation

Strategic Plan: The Modern Application Delivery Playbook

by Diego Lo Giudice and Christopher Condo
April 12, 2018

Why Read This Report

Customer-obsessed organizations are accelerating their race to digital in order to win new customers and retain existing ones. A crucial element of this imperative is to transform their software delivery processes to create high-value experiences for customers, employees, and partners. This report describes how application development and delivery (AD&D) pros should shape their application delivery strategy to deliver high-quality apps quickly and at low cost.

This is an update of a previously published report. We have updated it to include findings from our last 12 months of research in Agile and development and operations (DevOps).

Key Takeaways

Customer Choice Makes Transformation Urgent

Customer-obsessed organizations with little customer lock-in cannot change fast enough. When customers have attractive alternatives, great customer experiences help organizations win new customers and retain existing ones. Agile techniques, augmented by (DevOps), help organizations respond.

Engaging Software Dev Teams In Business Strategy Yields Better Results

When app delivery teams connect better with customers, they deliver better results with less overhead and less waste. To engage them, make them equal partners in forming and executing the business strategy.

Adopt A Four-Step Process For Continuous Transformation

Transform team capabilities with four key steps: Identify improvement opportunities with value streams, implement change, deliver results, and measure impact. Then repeat. Successfully applying this process requires a combination of top-down executive leadership and bottom-up, team-level engagement.

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April 12, 2018

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- [Make A Modern Business Case For Agile And DevOps-Driven Digital Transformation](#)
- [Organize Your App-Dev Teams With Agile And DevOps](#)
- [The State Of Agile 2017: Agile At Scale](#)



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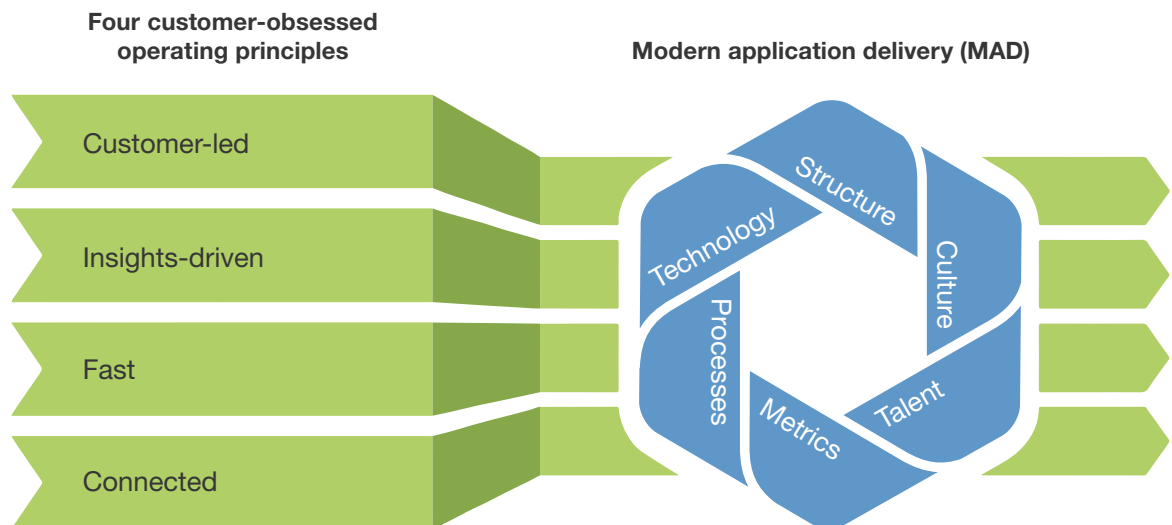
Go Fast Or Go Home

Technology is rapidly dismantling long-established business models and creating new ones in their place. As AD&D pros know, it's not only unicorns like Netflix or Tesla that are disrupting markets. Traditional brick-and-mortar companies like The Home Depot give customers an end-to-end digital experience from mobile into the store. Our data shows that no industry is immune to digital disruption — and while innovators are using software to shatter entrenched business models, established competitors are scrambling to respond.¹ As a result:

- › **Delivering software with speed and quality is now essential.** As software takes a central role in modern business models, application delivery capability has become the essential enabler of an organization's digital business strategy. Long-cycle planning and extended application delivery cycles are no longer responsive enough to support the fast element of Forrester's customer-obsessed operating model (see Figure 1).
- › **Customers won't wait.** In a world dominated by software, products are more dynamic, change is continuous, and rapid delivery cycles are the norm. The clock is ticking, and customers are determining its speed. Moneyfarm and Betterment, financial tech firms focused on wealth management, are attracting new clients away from traditional banks to their innovative online portfolio investments advisory. Meanwhile, companies like PayPal's Venmo are eating into the payment transaction business and further reducing the importance of traditional brick-and-mortar banks.²

FIGURE 1 Customer-Obsessed Organizations Are Accelerating Digital Transformation With Modern App Delivery

Customer obsession needs fast MAD!



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Speed, Yes, But With High Quality

Software delivery practitioners tell us regularly that faster delivery has little value if the quality is low.

Many AD&D organizations struggle to:

- › **Deliver the right solution — no more, no less.** When customers have almost limitless choice and limited time, delivering the right solution quickly is essential. Delivering more than they need is a waste of time and effort; delivering less means lost opportunities and disappointed customers. The old approach of delivering loads of features and hoping that something will stick has given way to minimal feature sets that deliver exactly what the customer needs — no more, no less — as quickly as possible.
- › **Deliver, learn, and repeat — quickly.** Long-term strategic planning and lengthy product cycles have given way to a feedback-driven cycle in which customer needs and competitive threats change quickly. This model is driven by real-time testing in production. Software's ability to quickly reshape products enables AD&D pros to develop, deliver, and test new ideas quickly, over and over. AD&D pros need a new application approach, but old habits are hard to kill.
- › **Deliver without sacrificing quality or speed.** Conventional wisdom holds that increasing speed reduces quality. This is true for traditional approaches, but new approaches to app delivery enable delivery speed and high quality at scale.³ Continuous delivery approaches automate quality testing at every step of the process rather than letting testing pile up at the end. Techniques like continuous testing enable fast feedback early, reducing wasted time and effort and speeding up delivery.⁴

The Barriers To Aligning Business Strategy And App Delivery

New business strategies focused on customer obsession require a holistic approach, one that more directly connects development and delivery teams to business strategy and to customers. But we find that many efforts to align application delivery practices with a customer-facing strategy go awry, blocked by one or more pitfalls:

- › **Making Agile and Lean adoption an end in itself.** The adoption of Lean and Agile practices is a journey, not a destination. While they offer great principles and practices, they are substantially transformation-enabling frameworks. The primary objective of a strategic transformation should be to achieve better and more aligned business outcomes faster. Another related issue is that AD&D teams often plan adoption programs with defined start and end dates. Instead, an open-ended transformation program is the only way to tune your engine so that it's ready for continuous change.
- › **Driving a bottom-up-only strategy.** Forrester data shows that organizations that have scaled Agile usually start at the team level and scale it up to the enterprise over multiple years.⁵ Gary Gruver, in *A Practical Approach to Large-Scale Agile Development*, argues that introducing Agile at the team level and then scaling it up to the enterprise is hard, slow, and prone to failure.⁶ Other

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large-scale Agile transformations we've observed over the years, at BBVA, Capital One, IBM, ING.com, Microsoft, Santander Group, and other companies, all had a strong top-down program complementing efforts from the bottom up.⁷

- › **Tactically focusing on Agile in the upstream and missing benefits downstream.** The adoption of Agile in these programs sometimes focuses on just the project/management aspects of Agile — or Agile in the upstream. That 75% of respondents in Forrester's Q3 2017 Global Agile Software Application Development Online Survey have adopted Scrum reflects this.⁸

"The most critical aspect of incomplete Agile scaling strategies is failing to build a strong quality system in your architecture integrated with continuous development and delivery." (Gary Gruver, president, Gruver Consulting)

Improve Business Results By Executing A Lean Delivery Strategy

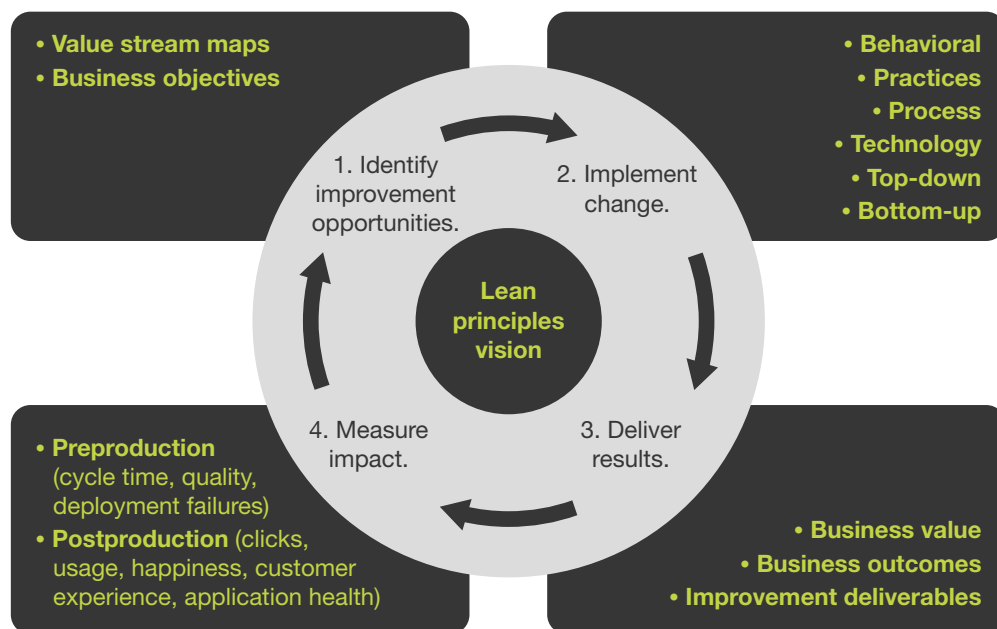
To deliver better software faster, AD&D leaders must accelerate the performance of software delivery teams. While some organizations can start fresh with Agile and DevOps on new initiatives, most struggle to shed their old waterfall ways. So, what's the best way to develop a strategy to improve delivery? There is no single recipe. Strategies depend on various factors, such as leadership vision, cultural context, business domain, level of disruption and customer obsession, existing delivery capabilities, and more. But the following are three key aspects that successful AD&D leaders execute on, and various industry thought leaders agree on, for how Lean and Agile can successfully help transform businesses:

- › **Address cultural change.** Jez Humble, co-author of the book *Lean Enterprise, How High Performance Organizations Innovate at Scale*, asserts that when building a Lean enterprise, it's imperative to change the mindset and behaviors of the entire organization. This starts with senior leadership creating a culture of learning and experimentation.⁹ General Electric (GE), for example, is adopting a Lean culture throughout the organization.¹⁰
- › **Make it stick.** After years of working in waterfall, many clients face the problem of making behavior changes stick for the long term. It's a known change management issue that at the first obstacle or opportunity people turn back to old, more comfortable habits, and in Agile and DevOps this happens all the time. Vendors like IBM, Pivotal Software (Labs), SapienRazorfish, and other consultancies employ labs or "garage"-based experiences to provide clients with immersive training and hands-on coaching. Clients are working in Agile on their product development while learning from the experts, experimenting with them, and making change a lasting experience.¹¹ Executives must lead the change initiatives with dynamism and courage.
- › **Build-measure-learn.** The feedback loop that Eric Ries describes in *The Lean Startup* introduces new management approaches to execute effectively in environments of uncertainty.¹² The goal of the loop is to learn from uncertainties by running experiments. Even large enterprises, such as GE and Intuit, have implemented Lean Startup and Agile techniques to transform their organizations.

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These and newer enterprise frameworks like Scaled Agile Framework (SAFe) and Scrum.org's Nexus facilitate scaling faster delivery practices at enterprise levels; 28% of our 2017 Agile survey respondents had adopted some form of SAFe.¹³ All of these frameworks are good guidance. From an operational perspective, enterprise AD&D teams' transformation strategies need to set a continuous improvement plan that follows four iterative steps: Identify improvement opportunities, implement change, deliver results, and measure impact (see Figure 2).

FIGURE 2 Continuously Refine Your Agile Strategy**Step 1: Identify Improvement Opportunities**

Before initiating the journey, make sure everyone in the organization knows Lean principles and values and internalizes them.¹⁴ Usually, about a quarter of an organization's workforce will be open to embracing change. Involve them in your strategy because they will become the change agents. During Royal Philips' global transformation, CEO Frans Van Houten chose to empower his executives and management to enable change throughout the organization.¹⁵ Here's a pragmatic way to identify improvement opportunities:

- › **Adopt Value Stream Management (VSM) to eliminate waste and focus on value.** Visually mapping key value streams will expose the barriers to faster delivery in a process, and it reminds everyone of what they need to fix urgently. A key step in VSM is mapping, a customer-driven approach that complements customer experience journey mapping.¹⁶ VSM helps identify and

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resolve disconnects, redundancies, and gaps at the process level to deliver outcomes in the customer journey.¹⁷ It also helps all stakeholders visualize flow in terms of bottlenecks and value being delivered.

“Using VSM allowed us to see where we were losing valuable time in our delivery processes. We went into it thinking that we needed to automate application deployment, but we came out of it realizing that our decision-making processes were the largest source of delays.” (Application development director, major telecommunications company)

- › **Charter the VSM work.** A one-page charter that describes the scope of VSM activity, the expected benefits for business and customers, and the VSM resources provides the visibility you need to make decisions (see Figure 3).¹⁸ The charter sets boundaries for possible interventions and provides information about where to go to substantiate delivery process data.
- › **Define the current state and identify opportunities for improvement.** Prepare by visiting the actual people involved in the value stream and asking them the right questions to understand how value (and waste) is created; this is similar to walking a physical production line to examine how raw materials are turned into finished products.¹⁹ Then run two time-boxed workshops to draw your VSMS. On day one, define the current VSM by highlighting things like lagging lead times or throughput, process time on steps, and where non-value-add activities or waste sit and why. On day two, add to the VSM by drawing information on where improvement opportunities exist and what improvement targets you should set.
- › **Create an improvement plan, removing the biggest obstacles first.** Next, run a workshop to create a prioritized plan that describes how improvements will be made, when, and by whom. Focus on the biggest obstacles first (see Figure 4).

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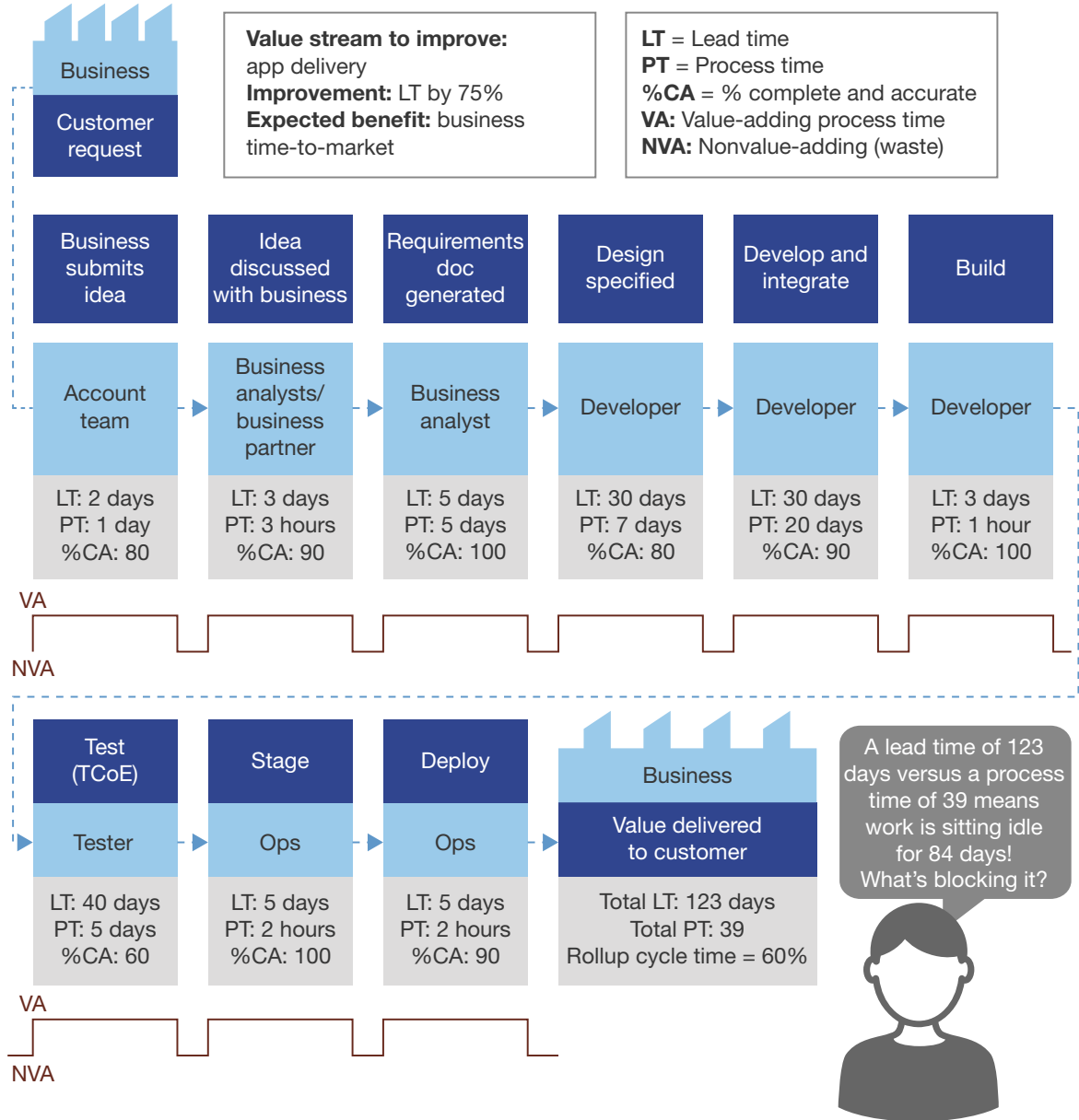
FIGURE 3 A Value Stream Charter Gives You Visibility Into Scope, Responsibilities, And Expected Benefits

Value stream being improved: Application delivery	Who's in charge: Executive sponsor: CIO or VP of app delivery VSM champion and facilitator: project management office (PMO)
Logistics <ul style="list-style-type: none"> • Gemba walks in departments, access systems — week No. 1 • Value stream mapping (VSM) current-state workshop No. 1 (8 hours) • VSM target-state workshop No. 2 (8 hours) • VSM transformation plan workshop No. 3 (8 hours) • Ample wall with stickers • Briefings for consensus and communication 	
Current state — what's driving the need for improvement: Business wants more frequent releases delivered	Expected customer benefit: Improved digital customer experience
Expected business benefit: Faster time to market; beat competition	Mapping team appointed: VP of applications, VP of operations, VP of testing, product owner, PMO
Measurable target condition: 75% improvement on lead time	On-call support: Subject matter expert (SME) contacts needed on call during workshops

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FIGURE 4 Define Value Streams To Visually Identify Waste And Focus On Customer Value



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Step 2: Implement Change

You now have not only a plan to remove the most important obstacles but also a pragmatic practice for identifying obstacles that you can repeat and improve. No transformation can happen before there is evident focus on change management. If change is not happening, you risk fixing issues and removing obstacles that will soon reappear because people's behaviors have not changed. Implement five change activities in your improvement plans:²⁰

- › **Modernize your mindset and behavior.** It's behavior that produces results. Behavioral change must happen throughout the entire organization; in most cases, leaders will need to lead by example. Lean Startup, Lean Kanban, Creative Networker, and similar modern management initiatives are all about introducing new management styles to turn organizations into learning organizations that can continuously improve.²¹ Managers should enable and facilitate, discuss and communicate continuously, and stay connected with their people — not give directions and practice control.

"I put people in four behavior buckets: 1) enthusiastic yes-people; 2) apathetics; 3) skeptics with a good heart; and 4) early adopters. Skeptics and early adopters are the ones to gather feedback from during the early days of your transformation." (Chief technologist, software product company)

- › **Create a sense of urgency and make change part of everyone's job.** If your business is being disrupted, there is probably enough sense of urgency to jump on the Change Train. If your delivery VSM looks like the one in Figure 4, coders and testers will probably have a sense of urgency about the waste in throughput. Don't create ad hoc jobs and activities dedicated only to change; instead, embed and extend existing processes and activities involving change in the daily activities of everyone in your organization.²²
- › **Lead change from the top down for faster results.** Business leaders need to be transformation leaders. In this case, transformation strategy will have highly visible executive transition leaders and a strategy that mirrors the business strategy. Leaders might define new business models, and they might renew the entire high-level, concept-to-cash value stream. Clearly appointed and dynamic executive leadership will make a difference. Many transformation teams for organizations we've interviewed appointed a dynamic executive leader who synced up business and technology management continuously.

"Frequently, we broke through the hierarchy and identified motivated champions to make change happen. We have created an environment where there is room for people to fail, as long as people learn from it and do not make the same mistake twice. It is all about continuously improving ourselves!" (Edgar Van Zoelen, head of HealthSuite Labs and ecosystem management, Royal Philips)

- › **Enable bottom-up initiatives when the pressure is lower.** If market conditions aren't pressuring you to change, you have an opportunity to focus on known pains in the delivery process. Perhaps it takes far too long to deliver new projects, quality is below target, or teams have recognized that Agile and continuous delivery offers a better approach and would like to experiment. These are

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usually spot initiatives at a team level, where relatively small investments in new capabilities can prove a better approach. Leading by example will be the best choice: Find pains, fix them, and repeat. This scenario is where most of the traditional market transformations have occurred; as markets shift from slower to higher speed, they tend to move into the first (top-down) category.

“We invested, on our own, two weeks of work to pull together a continuous delivery capability that adhered to compliance. Our compliance folks are the hardest to onboard to anything new; [they] became our best sponsors in rolling it out to more teams!” (Head of architecture, major financial services firm)

- › **Use both top-down and bottom-up strategies to make transformation scale.** The optimal strategy for accelerating delivery at scale is both top-down leadership and grassroots innovation at the team level. Most of the transformation cases we’ve seen prove that. This suggests that no matter where your business sits on the continuum, you can always innovate, and improving delivery capabilities will help you accelerate when business needs to! Large transformation-to-Agile programs extended with DevOps initiatives in companies like Compuware, IBM, Micro Focus and Microsoft, as well as Cognizant, Tata Consultancy Services (TCS), Tech Mahindra, and Wipro, leverage best practices and lessons from grassroots initiatives to empower thousands of developers to do more.

Step 3: Deliver Results

A completed VSM will record the following for each process step: *process time* (or touch time), which is the time it takes to complete the work; *lead time* (or throughput), which is the elapsed time it takes for work to be completed (from when it is available to when it is finished); and *percent complete and accurate*, which measures the quality of the work at that step. A target-state VSM will show the corresponding improvements in each of these metrics. Now it’s time for the action:

- › **Focus on the biggest improvement points.** The value stream documents the process of realizing value for the business and its customers. Discuss with business leaders and executives what’s the most important thing to fix next, then prioritize and fix it.

“One of our most critical business [processes] to fix in our Agile and DevOps journey was managing the life cycle of production components and open source libraries to minimize vulnerabilities. Through automation, we were able to reduce our review process from weeks to zero time. This automation, coupled with the complementary nature of Agile and DevOps practices, has led to a significant, measured upward to 48%, improvement in code quality.” (Michael Garcia, VP of DevOps service, Fannie Mae)

- › **Build a continuous delivery pipeline to deal with multiple speeds.** While customer-facing systems of engagement (SOEs) are the tip of the spear, the force behind them is the data that systems of record (SORs) manage, which enriches customer journeys.²³ SOEs change more frequently, but SORs can’t stand still. When organizations deliver modern applications, they have

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to coordinate software delivery across a wide range of platforms, including social media, search-based advertising, various SOE platforms, and multiple SORs. Businesses' need for speed ranges from fast to faster: AD&D pros will need to deal with more than just slow or fast.

Step 4: Measure Impact

Continuous delivery practices enable software teams to continuously measure the health of their delivery process and improve delivery capabilities early. Metrics can be the perfect tool to track what's working and what isn't, both at the business concept or value-stream level and at the detailed transformation subsegment level. However, you should define and use metrics to focus and initiate the right conversations or analysis on the problem areas so your teams can correct them. Focus some metrics on understanding if you're delivering value to the business and use them to reset your improvement priorities.²⁴

Concentrate on a few metrics that help sustain a constant and efficient process of removing obstacles:

- › **Track metrics like cycle time, quality, and deployment failures.** Cycle time — the time from when code is committed to when it is deployed — is important because it measures the responsiveness of the app delivery team and highlights eventual bottlenecks in the delivery pipeline. One key cycle time metric is mean time to repair (MTTR). Focus quality metrics on functional quality to track whether you are delivering the right solution to customers or users. At the micro level, you should also measure quality in terms of incidents in production, defects found during testing, or the bug ratio in sprints.
- › **Introduce new postproduction customer and user metrics.** Teams define postproduction metrics to understand how the applications they've deployed affect business performance. Business metrics generate a wealth of postproduction data, which product managers and marketers categorize and monitor. This data goes well beyond what operations teams traditionally provide to AD&D leaders, allowing them to improve the impact of their delivery — and overall application performance.²⁵ Typical postproduction metrics are clicks, usage, happiness, downtime revenue impact, and preferences to measure customer experience along with application health.
- › **Run analytics on both and correlate to see what needs improvement.** AD&D teams can automatically generate the data for nearly all of these metrics by instrumenting the code during design and development, in addition to using ad hoc querying tools. The amount of data can be overwhelming, which is where analytics and big data come in. AD&D leaders can use these tools to find correlations in the sea of data that the business and developers couldn't identify without the support of tools, dashboards, or dedicated algorithms.

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What It Means

Business Context Will Drive Software Delivery Strategy

Your strategy for transforming to continuous delivery will largely depend on the business context that your enterprise will be living through over the next 10 years. AD&D pros must understand what rate of change the business will need as it gets deeper into the age of the customer. Additionally, a large, global corporation will see differing rates of change by division or by country. In that case, the best strategy might be to adapt your capabilities to the fastest one. Here are the scenarios:

- › **The business leads and disrupts markets (inside-out).** This strategy depends on your business leaders and the type of market you are in. Your market might be fast moving, and business leaders might want to drive the disruption. An effective way to execute strategy will be to lead from the top down, enable bottom-up transformation, and roll out change as fast as you can. A continuous software delivery engine will be your business' secret weapon.
- › **Markets disrupt the business (outside-in).** In this case, your business is undergoing the disruption, not leading it. Here, the business must also be in the driver's seat of transformation. This is higher risk; you don't want to make the same error Blockbuster made in overestimating how much time it had to transform. Markets will determine the pace and the intensity of disruption and how fast you need to move. You are still in the hot seat in terms of providing the secret software delivery weapon, the best defense from the attack.
- › **In all cases, the business has a strategy for continuous pivoting.** In both of the above scenarios, a three- to five-year strategy plan is a thing of the past. You must continuously review your strategy and be ready to pivot. This means implementing an efficient feedback loop from customers and markets all the way back to your ideation and epics. Once you've kicked off the overall transformation, continuous adjustment based on the feedback will follow. You will iteratively remove obstacles from specific value streams' subsegments (from idea to requirements, from build to test, or from integrate to deploy) or support the realization of entirely new value streams if that's what the business needs.

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Supplemental Material

Survey Methodology

Forrester's Q3 2017 Global Agile Software Application Development Online Survey was fielded to 232 readers of Forrester's Agile reports with knowledge of their firm's Agile practices. For quality assurance, we screened respondents to ensure they met minimum standards in terms of content knowledge.

Forrester fielded the survey in May 2017. Respondent incentives included a complimentary copy of this report. Exact sample sizes are provided in this report on a question-by-question basis. This survey used a self-selected group of respondents and is therefore not random. This data is not guaranteed to be representative of the population, and, unless otherwise noted, statistical data is intended to be used for descriptive and not inferential purposes. While nonrandom, the survey is still a valuable tool for understanding where users are today and where the industry is headed.

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Companies Interviewed For This Report

Banco Bilbao Vizcaya Argentaria (BBVA)	Perfecto
Blueprint Software Systems	Pivotal Software (Labs)
CA Technologies	Royal Philips
CI&T	Santander Group
Cognizant	SapientRazorfish
CollabNet	Scrum.org
Dell	Skytap
EPAM Systems	Sonatype
FINRA	Tasktop
General Electric (GE)	Tata Consultancy Services (TCS)
IBM	Tech Mahindra
Infosys	ThoughtWorks
Macy's	VersionOne-CollabNet
Micro Focus	Wipro

Endnotes

¹ In *The Phoenix Project*, unicorns are defined as digitally native companies like Amazon, Etsy, Google, and Netflix. Source: Gene Kim, Kevin Behr, and George Spafford, *The Phoenix Project: A Novel about IT, DevOps, and Helping Your Business Win*, IT Revolution Press, 2013.

Manufacturing companies are shifting from selling aircraft engines to selling a service that minimizes downtime for turbines, engines, and industrial controls by using software to monitor and maintain products before downtime occurs. Source: Forrester/Odgers Berndtson Q3 2015 Global Digital Business Online Survey.

² Source: Moneyfarm (<https://www.moneyfarm.com/uk/>).

Source: Betterment (<https://www.betterment.com/>).

Source: Venmo (<https://venmo.com/>).

³ It's not just speed that digital businesses need but speed with quality, or quality at speed. See the Forrester report "[Five Must-Do's For Testing Quality At Speed.](#)"

⁴ In the new world of modern application delivery, testing radically changes. See the Forrester report "[Vendor Landscape: Continuous Testing Services For Agile And DevOps Environments.](#)"

⁵ Twenty-two percent of respondents to Forrester's Q3 2017 Global Agile Software Application Development Online Survey claim to have scaled Agile to the entire enterprise, and 40% say Agile practices have been in use in their organizations for four or more years. See the Forrester report "[The State Of Agile 2017: Agile At Scale.](#)"

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- ⁶ You can find more about Gary Gruver's practical approach to Agile large-scale transformation in his book. Source: Gary Gruver, Mike Young, and Pat Fulghum, *A Practical Approach to Large-Scale Agile Development: How HP Transformed LaserJet FutureSmart Firmware*, Addison-Wesley Professional, 2012.
- ⁷ See the Forrester report "[Embrace Holistic Change To Achieve Agile Results.](#)"
- ⁸ See the Forrester report "[The 2015 State Of Agile Development.](#)"
- ⁹ Source: Jez Humble, Joanne Molesky, and Barry O'Reilly, *Lean Enterprise, How High Performance Organizations Innovate at Scale*, O'Reilly Media, 2015.
- ¹⁰ Source: Brad Power, "How GE Applies Lean Startup Practices," *Harvard Business Review*, April 23, 2014 (<https://hbr.org/2014/04/how-ge-applies-lean-startup-practices>).
- ¹¹ See the Forrester report "[Tackling The Cultural Challenges Of Agile And DevOps Transformations](#)" and see the Forrester report "[Digital Studio Engagements Accelerate Services Innovation.](#)"
- ¹² Source: Eric Ries, *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Currency, 2011.
- ¹³ Source: Forrester's Q3 2017 Global Agile Software Application Development Online Survey.
- ¹⁴ Transforming application delivery into a more agile and feedback-based process requires new values and principles at its heart. See the Forrester report "[Embrace Holistic Change To Achieve Agile Results.](#)"
- ¹⁵ Source: Martin Mocker, Jeanne W. Ross, and Eric Van Heck, "Transforming Royal Philips: Seeking Local Relevance While Leveraging Global Scale," MIT CISR, February 27, 2014 (http://cizr.mit.edu/blog/documents/2014/02/27/mit_cizr_wp394_philips_mockerrrossvanheck-pdf/).
- ¹⁶ Customer experience journey mapping helps define and improve customer experience for buying and using products and services with your enterprise. See the Forrester report "[Mapping The Customer Journey.](#)"
- ¹⁷ VSM is particularly well suited to the transformation of app delivery in the age of the customer because it embraces customer-centric thinking from the very beginning. In fact, a VSM is defined to eliminate waste and produce value for business and customers. There are various popular literature and books on VSM; for this research, we've used the pragmatic book *Value Stream Mapping*. Source: Karen Martin and Mike Osterling, *Value Stream Mapping: How to Visualize Work and Align Leadership for Organizational Transformation*, McGraw-Hill Education, 2013.
- ¹⁸ We suggest you find your own way of doing VSM. Involving execs shows that leaders care about and are committed to your transformation, but it also enables you to get things done in short three-day workshops. If non-decision-making individuals are involved, they will have to get permission from higher executives every time they need to make a key decision, making the process longer, more cumbersome, and less effective.
- ¹⁹ See the Forrester report "[Self-Assess Your Modern Application Delivery Capabilities.](#)"
- ²⁰ The modern application delivery playbook features a dedicated report on change; here we are just making sure you include change in the continuous improvement journey. See the Forrester report "[When To Stop Improving And Start Innovating.](#)"
- ²¹ For more on these movements, check out the following websites. Source: *The Lean Startup* (<http://theleanstartup.com/>); *LeanKanban* (<http://leankanban.com/>); and *Jurgen Appelo* (<http://www.jurgenappelo.com/>).
- ²² For example, by installing a continuous integration server that automatically kicks off unit tests as soon as code is submitted and which "retroverts" when bugs are found, developers become familiar with a continuous testing and integration approach. It also gets them in the habit of checking code continuously. Finally, it makes it evident how large batches of code can soon become a big pain for developers because bugs come back late, requiring more effort to fix them and making the job of integration harder.

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²³ See the Forrester report “[Master DevOps For Faster Delivery Of Software Innovation.](#)”

²⁴ See the Forrester report “[Agile Metrics That Matter.](#)”

²⁵ See the Forrester report “[Build The Right Software Better And Faster With Agile And DevOps Metrics.](#)”

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PRODUCTS AND SERVICES

- › Core research and tools
- › Data and analytics
- › Peer collaboration
- › Analyst engagement
- › Consulting
- › Events

Forrester's research and insights are tailored to your role and critical business initiatives.

ROLES WE SERVE

Marketing & Strategy Professionals

CMO
B2B Marketing
B2C Marketing
Customer Experience
Customer Insights
eBusiness & Channel Strategy

Technology Management Professionals

CIO
› **Application Development & Delivery**
Enterprise Architecture
Infrastructure & Operations
Security & Risk
Sourcing & Vendor Management

Technology Industry Professionals

Analyst Relations

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