

# Nimble To The Core: Drive Continuous Delivery And DevOps At A Holistic Level

Vision: The Continuous Deployment Playbook

by Charles Betz and Will McKeon-White

November 20, 2018

## Why Read This Report

Providing a great customer experience requires more than just a great product — it also takes a nimble and responsive organization that can continuously deliver digital innovation. As the demand for speed and flexibility grows at every layer of the organization, enterprises have turned to DevOps methods, driving a fundamental shift in how to approach core capabilities, organizational structures, processes, and tooling. This report offers infrastructure and operations (I&O) leaders guidance to embrace DevOps and continuous delivery at a core level.

This is an update of a previously published report; Forrester reviews and revises it periodically for continued relevance and accuracy. We're updating it now with new information, data, and examples.

## Key Takeaways

### **Embrace Continuous Delivery As A Core Competency**

With the ever-increasing pressures of the market, enterprises must leverage continuous delivery to improve product quality, velocity, and flexibility. Enterprises that fail to adapt to this new way of work will find themselves unable to adequately serve their customers' increasing and ever-changing demands.

### **Empower Employees Through Culture, Process, And Technology Transformation**

Focus on getting rigid structures out of the way of day-to-day work and enable team members with more automated self-service capabilities. These efforts, however, must dovetail with a culture of accountability and governance, where collaborative multidisciplinary teams take ownership of results.

### **Integrate And Automate For DevOps Success**

Automation is a great continuous delivery and DevOps enabler. It's evolved from infrastructure-as-code to include a more comprehensive build, release, and deploy pipeline. Enterprises must further integrate testing, security, and monitoring processes and technologies. This level of automation is essential to ensure that the team spends valuable time on the most important and innovation-oriented tasks.

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## Related Research Documents

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

[Become A Unicorn With Infrastructure-As-Code](#)

[Change Management: Let's Get Back To Basics](#)



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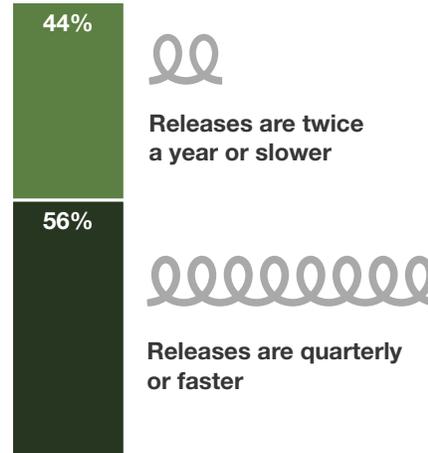
## Re-Envision Your Digital Delivery Approach From The Ground Up

Companies across all geographies and verticals face the conundrum of how to respond to changing business demands and heightened customer expectations. Customers expect firms to embrace speed-to-market and embed their most current needs into service delivery and product innovation. Competitive and ecosystem pressures accelerate the need for enterprises to continually deliver on new requirements and technical advances. I&O leaders must adapt their core organization, process, and technology approaches to address these realities:

- › **Slow and steady doesn't win the race, and the fast are getting faster.** If software delivery required acceleration in previous years, it now requires a jet engine — and operations professionals are stepping up (see Figure 1).<sup>1</sup> The increasing complexity and scale of distributed solutions, combined with greater change velocity, means that automation is now mandatory. In the past, application release packages often consisted of manual checklists requiring precise compliance by fallible humans. Today, the delivery of a new application can range from a simple, small script to a complex rolling deployment pipeline, with multiple configuration models for all elements of the stack as code.<sup>2</sup> Continuous delivery proponents see the opportunity for more-comprehensive automation, starting with automated testing and build management and moving through release and deployment for multiple environments.
- › **IT operational processes must be more flexible and continuously evolve.** Many operations pros have spent their careers implementing formal IT processes like change management and incident management, which have provided a measure of discipline and repeatability to the domain. However, inflexible IT service management process implementations can lead to a skewed focus on standardization and stability, to the detriment of speed. Change management, in particular, can cause friction between Agile development teams pursuing DevOps and their I&O organizations, especially manual change processes that can't keep up with or evolve to the needs of an accelerated and automated release cycle.<sup>3</sup>
- › **Stability and quality must not suffer.** Fundamental to continuous delivery efforts are the pursuits of automation, integrated tooling, and organizational and process alignment. These benefit multiple outcomes. DORA's State of DevOps 2018 survey determined that top-performing DevOps teams deployed 46 times more frequently, and drove lead time for changes from commit to deploy 2,555 times more frequently, than their least developed peers.<sup>4</sup> The study also supported the fact that speed need not sacrifice quality or stability. These elite teams, thanks to automation, more-collaborative organizational structures, and proactive maintenance, are seven times less likely to experience change failure compared with their low-performing peers, and their mean-time-to-recover (MTTR) is 2,604 times faster.<sup>5</sup>

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**FIGURE 1** The Majority Of I&O Teams Release Applications Quarterly Or More Frequently**“How often does your team (or teams) release applications?”**

Base: 2,054 global infrastructure decision makers whose firms are planning, implementing, or expanding their adoption of DevOps

Source: Forrester Analytics Global Business Technographics® Infrastructure Survey, 2017

## Focus On A Holistic DevOps And Continuous Delivery Transformation

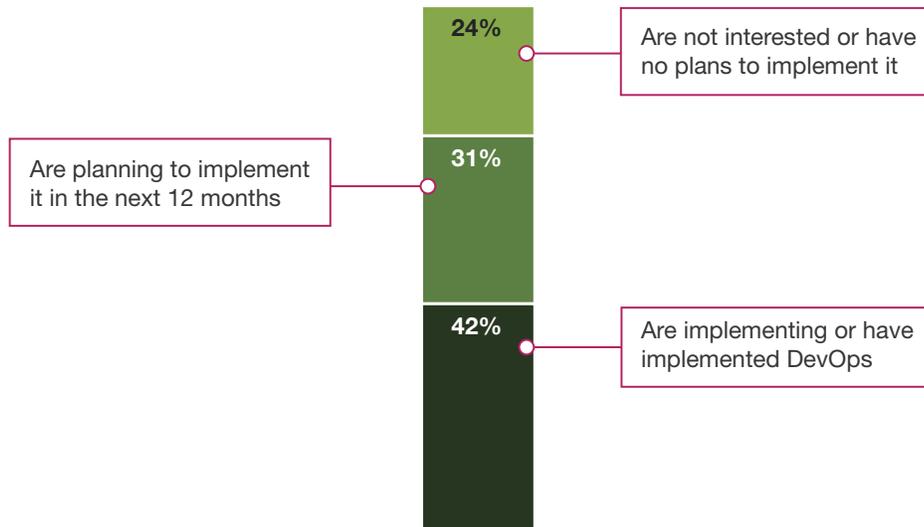
Enterprises are turning to continuous delivery and DevOps to become more adaptive as well as more resilient. In 2017, 42% of global infrastructure decision makers indicated that their firms are implementing or have implemented DevOps (see Figure 2). But these results don't tell the whole story: Most organizations have only just started to leverage DevOps and continuous delivery. To gain more traction and business value, organizations must move beyond a simple focus on velocity and isolated team initiatives to embrace more-holistic transformations.

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**FIGURE 2** A Majority Of I&O Decision Makers Report That Their Companies Have Or Will Pursue DevOps

**“Which of the following best describes the current state of DevOps adoption in your company?”**



Base: 3,923 global infrastructure decision makers

Note: We have excluded “don’t know” responses.

Source: Forrester Analytics Global Business Technographics® Infrastructure Survey, 2017

### People: Adapt Organizational Structures, Culture, And Talent

Enterprises must invest in evolving their overall organizational cultures, and simply renaming positions to “DevOps” doesn’t count. Whether pursuing fully integrated product teams or aspiring to a more virtual collaborative environment, to prosper with DevOps, development and operations leaders must address individual roles, team structures, and talent on an evolving basis.

- › **Continuously improve culture.** DevOps requires an organizational culture that emphasizes collaboration and progress over perfection. Successful teams encourage shared risk in innovation, even if it results in failure, because that ultimately leads to learning. Create and foster a sense of trust, experimentation, and cooperation. Nationwide Insurance is one example of an established DevOps initiative that’s continuously improving — following the initial pilot programs, the organization scaled its initiatives to reach across IT, consistently iterating on its DevOps strategies and changing the core work orientation of IT from project to product.<sup>6</sup> IT has moved from what was once considered a cost to the company to a driver of business success.

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- › **Empower people to transform processes and tools.** Don't let legacy organizational and process structure paralyze you; success with DevOps can help slay those dragons. One of Standard Charter's most unexpected successes in process optimization and automation came from a tool introduced by a single product leader who immediately recognized its utility, eventually transforming the firm's change review audit process from entirely manual to completely automated.<sup>7</sup>
- › **Share learning across the enterprise.** Knowledge sharing is invaluable in creating more replicable successes and fostering cross-enterprise collaboration. Organizations such as Capital Bank and Verizon have built on past successes and learnings, developing deployment and education courses or Dojos to roll out DevOps initiatives across the enterprise.<sup>8</sup>
- › **Incorporate feedback at every step.** It's critical to drive feedback from multiple stakeholders, including team members and customers, for continuous improvement of a product, service, or application. I&O pros should monitor and share information about the production environment to enhance performance, reliability, user experience, and business outcomes. Developers working in collaborative DevOps teams discover that "ops is hard," as one executive put it, because ops is ultimately responsible for how customers experience the software.

**Process: Embrace The Mindset Of Continuous Delivery**

To succeed, it's crucial for enterprises to evaluate where they can re-envision and optimize processes. A typical first step that many organizations use to identify opportunities for process improvement is value stream mapping, which outlines the detailed steps involved in the digital pipeline.<sup>9</sup> While many of these exercises look at the development life cycle, a more holistic view of all the processes that support the overall environment (e.g., change, incident, and governance) warrants a fresh look and mindset.

- › **Focus on delivering the product the customer wants, not on the framework.** Frameworks like ITIL, COBIT, IT4IT, and TOGAF are a means, not an end in themselves. If your organization has adopted one of these best-practice frameworks, you should already have a solid baseline of defined processes. See where you can reduce waste, what you can automate, and what you should make more flexible or federated — look for ways to eliminate process and technology silos.
- › **Make risk management a priority.** Organizations sometimes perceive I&O teams as overcompensating for risk, often delaying business innovation through restrictive policies and processes. Not all risk is bad, and DevOps supports a posture of effectively managing risk through several key strategies, such as reducing the size of changes in smaller blocks, automatically testing at multiple stages of the life cycle, reducing manual handoffs, and addressing compliance through automation and infrastructure, or "policy as code."<sup>10</sup> Multiple enterprises, even in heavily regulated sectors, have successfully mitigated risk and compliance concerns through these initiatives.<sup>11</sup>
- › **Recognize that change management is critical.** When releasing applications quickly, team members need to understand what's changed and then automatically capture and share that across the continuous delivery toolchain. Versioning is key — from application code and source

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repositories to deployment models that continuous delivery and release automation (CDRA) tools create to infrastructure configuration changes. Monitoring and incident management tools can combine information on these changes with real-time performance to better guide actions to reduce the MTTR.

- › **Evaluate your progress with critical DevOps metrics.** Forrester's research reveals that firms that have succeeded with DevOps primarily use six simple metrics to keep dev and ops in sync: 1) time-to-delivery; 2) deployment frequency; 3) change volume; 4) change success rate; 5) time-to-recovery; and 6) customer experience.<sup>12</sup> Present these, and other business critical metrics, in a single dashboard so all integrated product team members can easily view them.

**Technology: Make Automation A Top Priority**

Automation is essential to continuous delivery success, yet most infrastructure pros are just getting started in automating activities, from infrastructure provisioning to knowledge collection (see Figure 3). DevOps and I&O pros can capitalize on recent technological advances that help manage infrastructure-as-code and run IT operations like a business function with workflow automation, advanced analytics, and collaborative workspaces. DevOps and I&O engineers are increasingly moving to specialized product teams that implement and support a growing repertoire of digital development and operational technology.

- › **Assess foundational automation capabilities, and rationalize your toolchain.** The typical continuous delivery technical pipeline includes a variety of capabilities, from source control to build and deployment to monitoring. As your continuous delivery initiative expands, seek not only to eliminate process steps that produce waste but also to look for ways to eliminate siloes of automation — across the development and delivery pipeline and multiple tools across the enterprise. While you'll need a number of distinct products for some time, the industry is clearly moving to consolidation. An increasing number of vendors (including major cloud providers) are offering pipelines complete enough that dev and ops pros have significantly less need to wire together various point tools.<sup>13</sup>
- › **Invest in CDRA.** Successful continuous delivery and broader DevOps initiatives focus on driving both velocity and quality, and CDRA tools are pivotal to achieving both across the complete life cycle of a product.<sup>14</sup> CDRA tools model, deploy, and visualize complete release packages, infrastructure, middleware, and applications, including all dependencies. With these tools, dev and ops pros can test and implement complete packages rather than individual components, allowing them to better iterate and scale to support complex application environments.<sup>15</sup> They also allow for faster recovery to restore the exact state of any build or deployment of your product. For its retail app, Allainz Insurance's operations group implemented Micro Focus' Deployment Automation to create a simple, one-button push deployment process, freeing up technical resources from manual deployment and provisioning.<sup>16</sup>

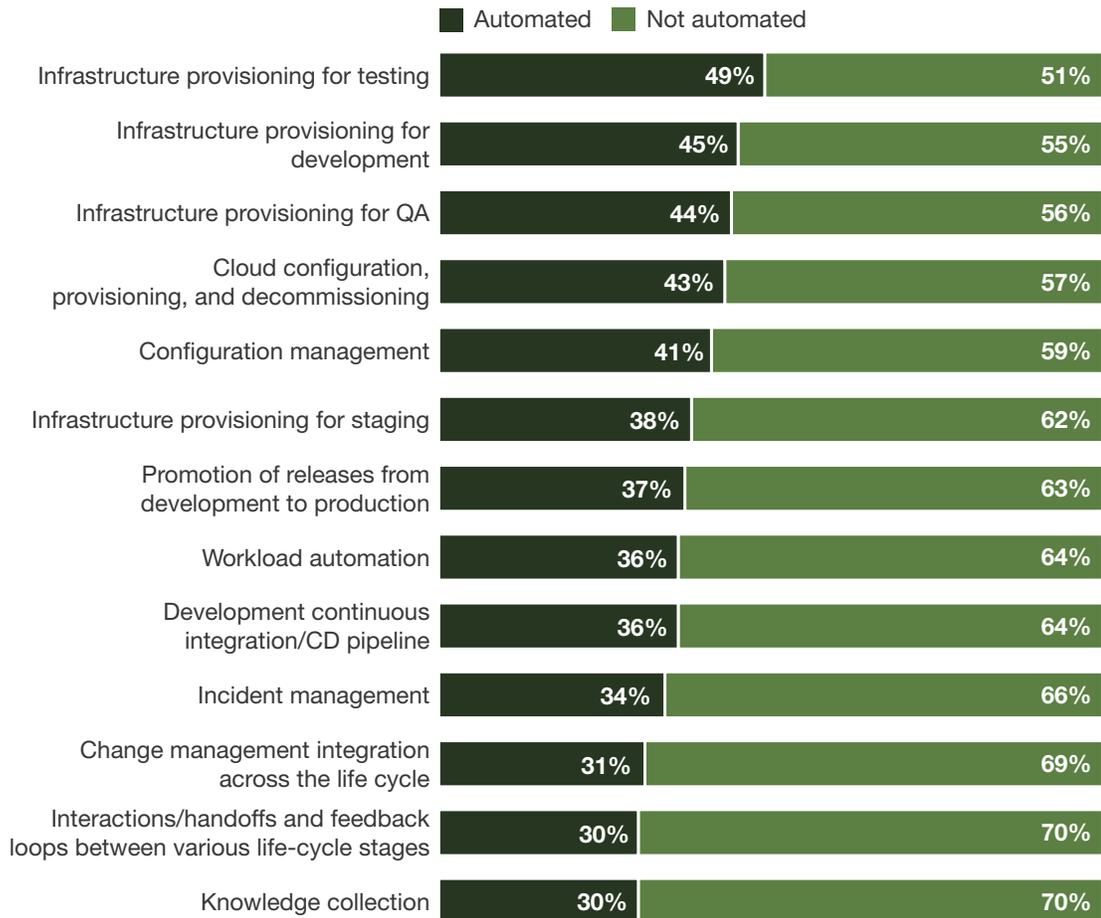
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- › **Improve speed, even deep in legacy and systems-of-record territory.** Customer obsession requires a culture of rapid and lean improvement, innovation, and willingness to try what's hard. Teams should know that even critical systems like client/server ERP solutions, such as SAP, aren't exempt.<sup>17</sup> Legacy applications, infrastructure components, and middleware are also candidates for continuous delivery. For example, Compuware has enjoyed significant success with "DevOps for the mainframe," integrating it into the broader toolchain and cutting down time to deploy by two-thirds. By embracing the mainframe as part of the broader continuous delivery pipeline, Compuware has enabled developer agility to deliver more value to customers.<sup>18</sup>
- › **Integrate and automate testing to drive change success.** Dev and ops pros have always struggled to perform complete systems tests properly. In a world where releases happen hourly, seamless test automation is mandatory. Experian CIO Barry Libenson describes testing as "the #1 bottleneck to delivery speed," adding, "When testing lags behind development, the organization is forced to delay their innovation and that's no longer an option."<sup>19</sup> Standard Bank in Africa reduced security testing that formerly took two weeks down to 48 hours with the use of Chef Automate.<sup>20</sup>

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**FIGURE 3** Automating Operations From End To End Is A Work In Progress**“Which of the following operations activities are automated?”**

Base: 2,054 global infrastructure technology decision makers whose firms are planning, implementing, or expanding their adoption of DevOps

Source: Forrester Analytics Global Business Technographics® Infrastructure Survey, 2017

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**What It Means**

## Move I&O From Operational Efficiency To Business Impact

Once an organization has adopted and mastered continuous delivery and DevOps methods, I&O professionals can turn more of their attention to innovation. I&O will evolve with less of a focus on day-to-day support and lead the company in identifying where and how automation and intelligence can unleash new capabilities and insights.

- › **I&O will become a principal driver of new product and customer experiences.** With increased agility and capacity to better analyze and impact digital business strategies and outcomes, I&O teams will play an even more critical role in product design and invention. Fully integrated in end-to-end application life cycles, I&O will proactively come to the table with new options and consistently feed insights and ideas upstream.
- › **I&O skill sets in engineering will grow more advanced.** Despite DevOps' collapsing of discipline silos and increasing calls for technology generalists, the disciplines won't go away — in fact, they'll become more intensive. DevOps teams and Site Reliability Engineers (SREs) are already deepening their skill sets — a necessity to address the increasing complexity and scale of modern systems. This will be both intentional and organic, with I&O and DevOps leaders sourcing (and training) from internal as much as external ranks.
- › **I&O will become a hub for advanced automation expertise.** Cognitive computing and robotic automation (advanced analytics, machine learning, RPA, and AI) are evolving at a rapid clip.<sup>21</sup> With increased involvement through DevOps and its pan-enterprise perspective, I&O leaders will better influence and, ultimately, drive strategies that integrate these new technologies into their businesses.

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## Supplemental Material

### Survey Methodology

The Forrester Analytics Global Business Technographics® Infrastructure Survey, 2017, was fielded in July and August 2017. This online survey included 3,923 respondents in Australia, Brazil, Canada, China, France, Germany, India, New Zealand, the UK, and the US from companies with two or more employees.

Forrester Analytics' Business Technographics ensures that the final survey population contains only those with significant involvement in the planning, funding, and purchasing of business and technology products and services. Research Now fielded this survey on behalf of Forrester. Survey respondent incentives include points redeemable for gift certificates.

Please note that the brand questions included in this survey should not be used to measure market share. The purpose of Forrester Analytics' Business Technographics brand questions is to show usage of a brand by a specific target audience at one point in time.

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## Endnotes

- <sup>1</sup> For more on the drive for agility in software delivery, see the Forrester report [“Agile And DevOps Adoption Drives Digital Business Success.”](#)
- <sup>2</sup> The stack includes infrastructure, middleware, applications, and database. For more on infrastructure-as-code, see the Forrester report [“Become A Unicorn With Infrastructure-As-Code.”](#)
- <sup>3</sup> For more on change management and how to evolve its processes for continuous delivery, see the Forrester report [“Change Management: Let’s Get Back To Basics.”](#)
- <sup>4</sup> Top-performing DevOps teams are referred to as “elite performers,” and the least developed are referred to as “low performers,” in the DORA 2018 survey. The survey compares these two groups for these differentials. Source: Jez Humble, “Accelerate: State of DevOps 2018: Strategies for a New Economy,” DORA, August 29, 2018 (<https://devops-research.com/2018/08/announcing-accelerate-state-of-devops-2018/>).
- <sup>5</sup> Elite-performing dev and ops teams represent the top 7% of respondents, and the study compares them with the bottom 15% of respondent performers for these figures. Source: Jez Humble, “Accelerate: State of DevOps 2018: Strategies for a New Economy,” DORA, August 29, 2018 (<https://devops-research.com/2018/08/announcing-accelerate-state-of-devops-2018/>).
- <sup>6</sup> Source: Nicole Bryan and Carmen DeArdo, “Project to Product: Practical Realities at a Large Scale Enterprise - Nationwide & Tasktop,” YouTube video, July 10, 2018 (<https://www.youtube.com/watch?v=3BQw5PTsCrU>).
- <sup>7</sup> Source: Shaun Norris, “Real-World DevOps Experiences from a 165-year Old Bank - Standard Chartered Bank,” YouTube video, July 10, 2018 (<https://www.youtube.com/watch?v=d5IMvK0YHTg>).
- <sup>8</sup> Source: Aimee Bechtle and John Schmidt, “When the Business Partners with Tech and They Do a Dojo - Capital One,” YouTube video, July 3, 2018 (<https://www.youtube.com/watch?v=WEJVE6PITJE>) and John Scott, Oliver Cantor, and Sanjeev Jain, “DevOps Is Not a Hobby but a New Avenue to Revenue - Verizon,” YouTube video, July 3, 2018 (<https://www.youtube.com/watch?v=7e2Chs4jRbg>).
- <sup>9</sup> For more on value stream mapping and how to leverage it for process optimization, see the Forrester report [“Haste Does Not Make Waste If You Improve Your Service Delivery.”](#)
- <sup>10</sup> For more information on effective agile governance, see the Forrester report [“Adopt Agile, End-To-End Technology Governance.”](#)
- <sup>11</sup> Source: Kurt Straube and Robert Stroud, “Bringing DevOps Success to Every App, Tool & Role in Your Org - XebiaLabs & John Hancock,” YouTube video, July 10, 2018 (<https://www.youtube.com/watch?v=ZtsTq0bmzRw>); Stephanie Gillespie and John Rzeszotarski, “Augmenting the Org for DevOps - KeyBank,” YouTube video, November 14, 2017 (<https://www.youtube.com/watch?v=83JVMOB86Wc>); James DeLuccia IV, Jeff Gallimore, Gene Kim, and Byron Miller, “DevOps Audit Defense Toolkit,” IT Revolution Press, 2015 (<http://bit.ly/DevOpsAuditDoc>); and Ben Grinnell, James Wickett, Jennifer Brady, Rob Stroud, Sam Guckenheimer, Scott Nasello, and Tapabrata Pal, “Dear Auditor,” Dear Auditor.org (<http://dearauditor.org/>).
- <sup>12</sup> For this research, Forrester originally leveraged customer examples from the DevOps Summit 2016 in San Francisco, looking at 40 customer metrics presentations and organizations’ five most commonly used metrics. Forrester also researched customers’ DevOps journey through the online community of DevOps.com. Source: DevOps.com (<https://devops.com/about/>).
- <sup>13</sup> For more information on the tools required, see the Forrester report [“TechRadar™: Continuous Deployment, Q2 2016.”](#)
- <sup>14</sup> Sample tools include CA Automate, Electric Cloud, IBM UrbanCode, Micro Focus, Release Automation, and XebiaLabs XLRelease/XLDeploy.

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<sup>15</sup> For an overview of the marketplace, see the Forrester report “[The Forrester Wave™: Continuous Delivery And Release Automation, Q3 2017.](#)”

<sup>16</sup> Source: “Allianz,” Micro Focus, 2017 ([https://www.microfocus.com/media/success-story/allianz\\_uk\\_ss.pdf](https://www.microfocus.com/media/success-story/allianz_uk_ss.pdf)).

<sup>17</sup> Source: Chris Kernaghan, “Can you do DevOps in SAP? - Chris Kernaghan,” YouTube video, November 29, 2017 (<https://www.youtube.com/watch?v=GSS4RHqUeig>).

<sup>18</sup> Source: “Mainframe DevOps,” Compuware (<https://compuware.com/lifecycle-overview/>) and Rosalind Radcliffe and David Rizzo, “Two Amazing Mainframe DevOps Transformation Case Studies - IBM & Compuware,” YouTube video, November 29, 2017 (<https://www.youtube.com/watch?v=ng0Y9LMetkM>).

<sup>19</sup> Source: Alan Shimel, “Tricentis, QASymphony Merge: The Age of Continuous Testing Is Upon Us,” DevOps.com blog, June 20, 2018 (<https://devops.com/tricentis-acquires-qasymphony-the-age-of-continuous-testing-is-upon-us/>).

<sup>20</sup> Source: “Transforming the delivery process,” Chef (<https://www.chef.io/customers/standard-bank/>).

<sup>21</sup> RPA is robotic process automation; AI is artificial intelligence.

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