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Elevating The Developer Experience

Investments In Tools And Automation Leads To Higher Productivity, Profitability, And Developer Satisfaction

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Executive Summary

Amid the worldwide developer talent crunch, with headcount and hiring buffeted by the pandemic and the "Great Resignation," many organizations are investing in the developer experience to enhance recruitment, retention, and competitiveness.

Nearly every organization has a developer experience (DevEx) strategy, yet few leaders believe the strategy is mature and delivering value. Firms aim to reduce development process friction by taming complexity in core areas such as Kubernetes, multicloud, and open source development.

Companies are backing up their developer experience strategy with higher investments in tools to enhance productivity and improve business value metrics. For most enterprises, DevEx is a work in progress. Many leaders concede they need to understand the application development and delivery process better.

In March 2022, VMware commissioned Forrester Consulting to evaluate the connection between developer experience and business value metrics and outcomes. To explore this topic, Forrester conducted an online survey with 651 respondents, including IT/engineering leaders and line-of-business (LOB) leaders in predominantly large enterprises. The results indicate that organizations that prioritize and invest in the developer experience stand to realize significant IT and business benefits that can improve their competitive positioning and profitability.

Key Findings

DevEx is both a journey and destination. While 94% of respondents say their firms have a DevEx strategy, only one in four believes that the approach is mature and delivers value. The majority of respondents' firms are aware of the need for DevEx and demonstrate a commitment to improving it with efforts such as self-service portals, developer training, and collaborative communications tools/platforms. However, most of them are in the early stages of this journey and place developer satisfaction levels a notch below overall employee satisfaction.

Improving developer experience will bring positive business results. More than two-thirds of IT and LOB respondents believe that improving DevEx will positively impact business objectives such as customer attraction and retention, customer satisfaction metrics, revenue growth, and profitability.

Good DevEx uncomplicates the complicated. Core enterprise considerations such as cybersecurity, Kubernetes, multicloud, and open source software have a transformative impact on enterprise architecture, along with software development tools and processes. Friction is a side effect of this complexity. Nearly three in five respondents agree that enterprise architecture complexity motivates them to deliver a better developer experience.

Measuring The Benefits Of A Better Developer Experience

From the original rudimentary mainframe punch cards to today's dazzling mobile gaming apps, developers have always been essential to coding and customizing applications. Now leaders increasingly understand that improving the developer experience is a competitive differentiator that is critical to their firms' customer experience and business strategy execution.

> **We define the developer experience as the skills, tools, frameworks, and methodologies aimed at creating, maintaining, and enhancing code throughout the entire software delivery lifecycle (from creation through production) and improving developer productivity, both individually and collectively.**

In making this commitment, firms have started to measure DevEx to gauge whether their investing in tools and other process changes improves key business value metrics. In surveying 651 IT/engineering and LOB leaders, we found that:

- **Good developer experiences matter.** Three in four respondents say DevEx is important or very important to business strategy execution. Accordingly, the same percentage of respondents believe their organizations' ability to compete in their markets stems from delivering quality software faster. Sixty-nine percent of respondents say good DevEx results in a better end-user/customer experience (see Figure 1).

Figure 1

Leaders Recognize Developers As Critical To Strategy Execution
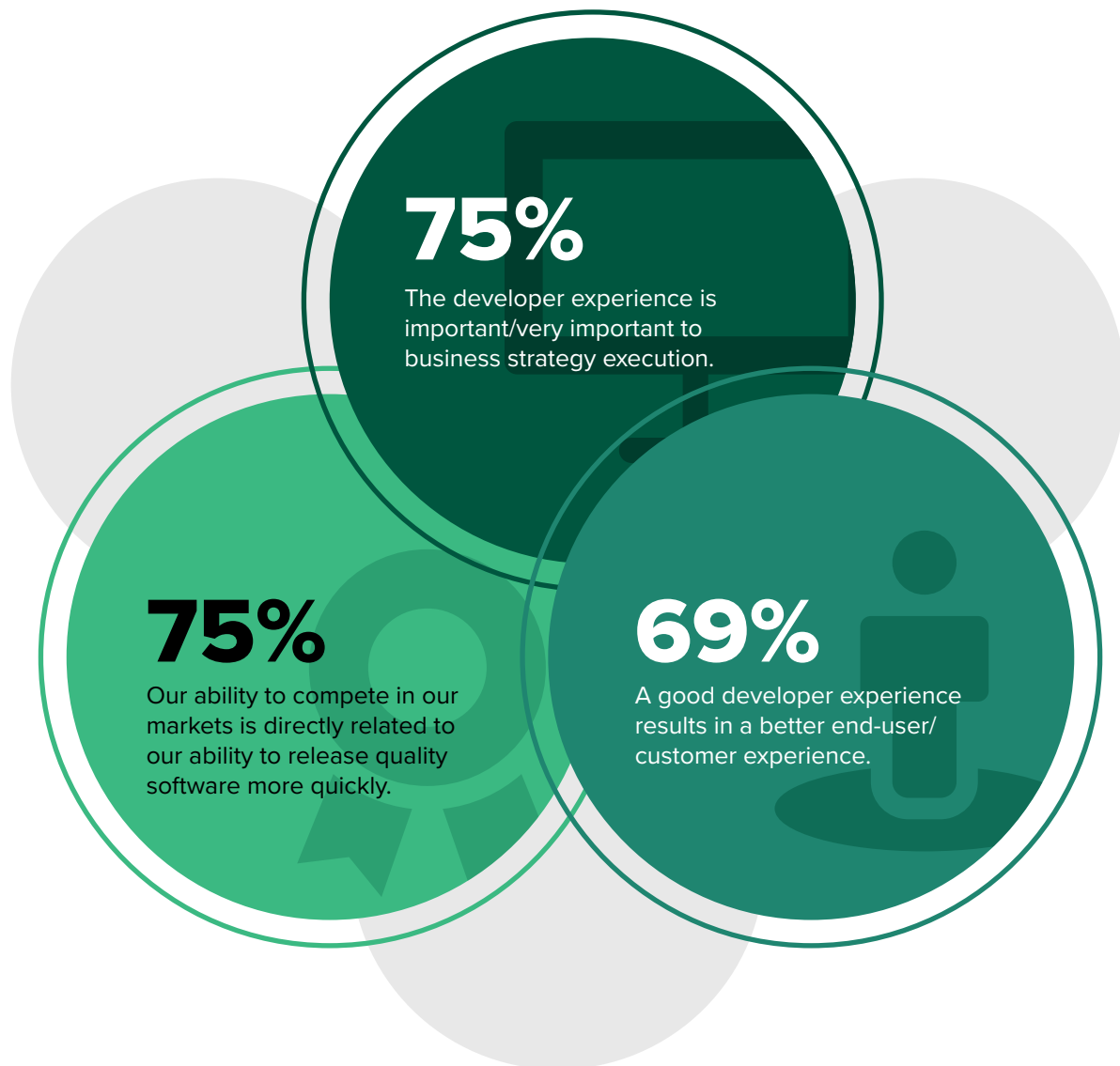
75%
The developer experience is important/very important to business strategy execution.

75%
Our ability to compete in our markets is directly related to our ability to release quality software more quickly.

69%
A good developer experience results in a better end-user/customer experience.

Base: 651 global IT/engineering and LOB decision makers with knowledge of their organizations' developer experience
Source: A commissioned study conducted by Forrester Consulting on behalf of VMware, March 2022

- **Measuring success requires multiple metrics.** Of the many targets firms set to measure their performance, none stand apart as the most successful. The two most common metrics are improved mean time-to-remediation/repair, or MTTR, and developer job satisfaction. A similar proportion of respondents deem both metrics as somewhat or very successful (See Figure 2).

Figure 2

How successful is your organization at attaining its targets for each of the following metrics?

● Somewhat successful   ● Very successful

Improved mean time-to-remediation/repair (MTTR)

| 33% | 28% |

Developer job satisfaction

| 35% | 25% |

Developer recruitment/retention

| 41% | 19% |

Developer experience

| 34% | 25% |

Improved security/meeting security standards

| 30% | 26% |

Business value metrics (e.g., revenue, customer metrics)

| 36% | 19% |

Fewer bugs

| 34% | 20% |

Developer productivity

| 29% | 24% |

Faster release of new products/services (i.e., time to market)

| 36% | 16% |

Time to onboard new developers

| 31% | 16% |

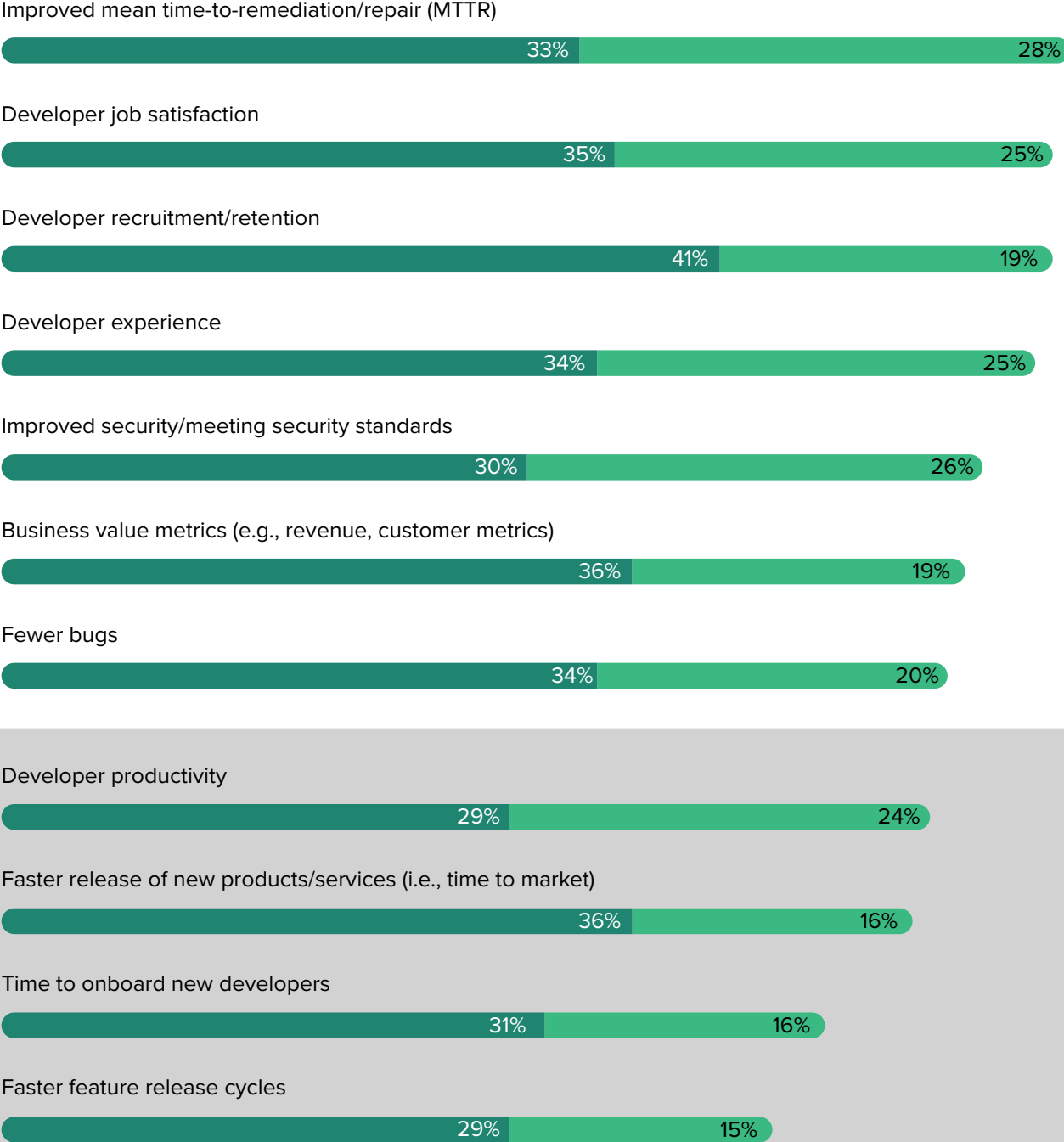Faster feature release cycles

| 29% | 15% |

Base: 651 global IT/engineering and LOB decision makers with knowledge of their organizations' developer experience
Source: A commissioned study conducted by Forrester Consulting on behalf of VMware, March 2022

Respondents marked several of the highest-impact business metrics, such as developer productivity or faster release cycles, with the lowest success ratings. This result is possibly because reaching complex milestones, such as higher developer productivity, shorter release cycles, and stronger business value metrics (revenue or customer retention, etc.), simply takes longer to materialize.

- **Developer satisfaction and DevEx are loosely intertwined.** Just two in five respondents use job satisfaction as a metric to assess their development team, but three in five respondents believe they successfully meet developer job satisfaction goals. Even so, leaders rate developers' job satisfaction eight percentage points below that of the average employee — an indication that DevEx remains a work in progress. Leaders that start a dialogue with their developers may gain insights and make changes that drive higher developer engagement and satisfaction.

- **Firms are optimistic about potential, but realistic about success.** While firms expect gains from DevEx efforts, they take a measured view of their current progress. For example, only about half of respondents say their organizations have been somewhat or very successful at reaching key targets like profitability, developer productivity, revenue growth, and faster release cycles. The good news is that over 70% of respondents believe improving DevEx would have a moderate or significant positive impact on these areas.

A good developer experience increases team morale, productivity, and speed.

Director-level telecom leader, India

A Focus On Tools To Improve The Developer Experience

Many knowledge workers experienced disruptive changes to how they work and collaborate as a result of the pandemic. At the beginning, business and technology managers feared that working remotely might negatively impact their company culture or collective productivity.
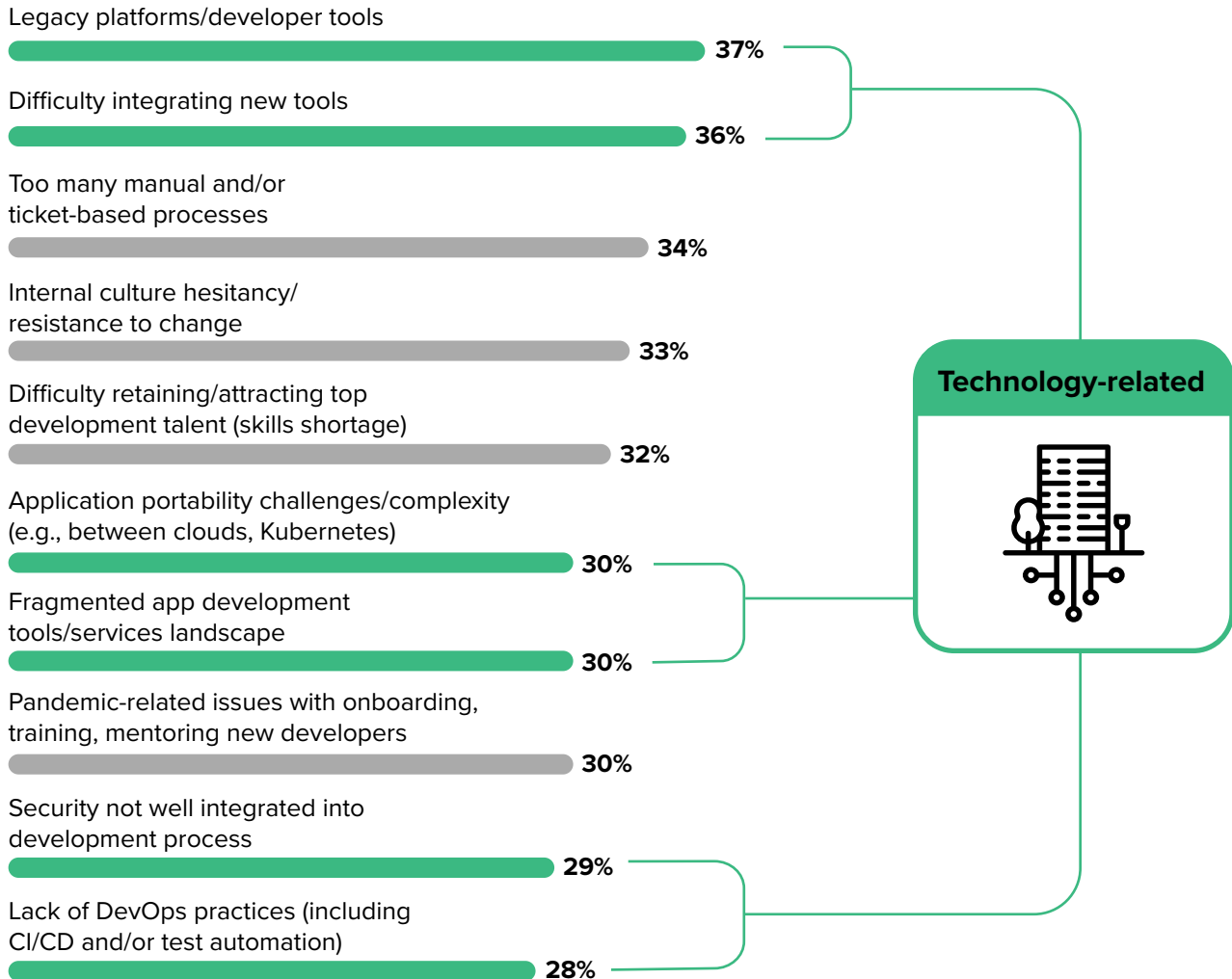
According to Forrester's research, the three most important job factors to developers are the languages, frameworks, and other technologies they'll work with; company culture; and flextime or a flexible schedule.[1]

For developers, figuring out remote work is no longer such an urgent problem. Other DevEx concerns are top of mind for the surveyed IT and business leaders, with 94% of respondents saying one or more significant obstacles inhibit their developers' productivity and experience. Respondents' organizations are battling these challenges on several fronts — identifying an average of four areas of friction (see Figure 3). The biggest challenges to developers' productivity and experience come down to their tools. Respondents indicate that the two most significant obstacles their developers have faced in the past year are legacy platforms/developer tools and the difficulty of integrating new tools.

- **Leaders are targeting legacy platforms and tools.** While organizations may face multiple challenges, LOB and technology leaders have aligned their priorities with their perceived needs. Topping the to-do list of challenges to address are legacy platforms/developer tools, followed by the difficulty of integrating new tools. Other pressing challenges include internal culture hesitancy and difficulty retaining and attracting top development talent.

Figure 3

Which of the following, if any, have become significant obstacles to your developers' productivity and experience in the past 12 months?

Legacy platforms/developer tools
37%

Difficulty integrating new tools
36%

Too many manual and/or
ticket-based processes
34%

Internal culture hesitancy/
resistance to change
33%

Difficulty retaining/attracting top
development talent (skills shortage)
32%

Application portability challenges/complexity
(e.g., between clouds, Kubernetes)
30%

Fragmented app development
tools/services landscape
30%

Pandemic-related issues with onboarding,
training, mentoring new developers
30%

Security not well integrated into
development process
29%

Lack of DevOps practices (including
CI/CD and/or test automation)
28%

Technology-related

Base: 651 global IT/engineering and LOB decision makers with knowledge of their organizations' developer experience
Note: Showing top 10 obstacles
Source: A commissioned study conducted by Forrester Consulting on behalf of VMware, March 2022

- **Obstacles abound when improving DevEx.** There is no single overwhelming issue that prevents or inhibits organizations from improving DevEx. They encounter many obstacles to improving the developer process, ranging from decentralized development teams and management to company culture to a fragmented ecosystem of tools that present learning and integration challenges. (See Figure 4).

Figure 4

What, if anything, prevents your company from improving the developer experience?

37%
Decentralized software development teams and management

36%
Difficulty recruiting/retaining talent

34%
Lack of a defined developer experience strategy and/or ownership

33%
Company culture

31%
Fragmented ecosystem of tools (that present learning/integration challenges)

27%
Inadequate funding/budget

26%
Developer experience is not a high priority

24%
Lack of measurement

Base: 651 global IT/engineering and LOB decision makers with knowledge of their organizations' developer experience
Note: Showing top eight responses
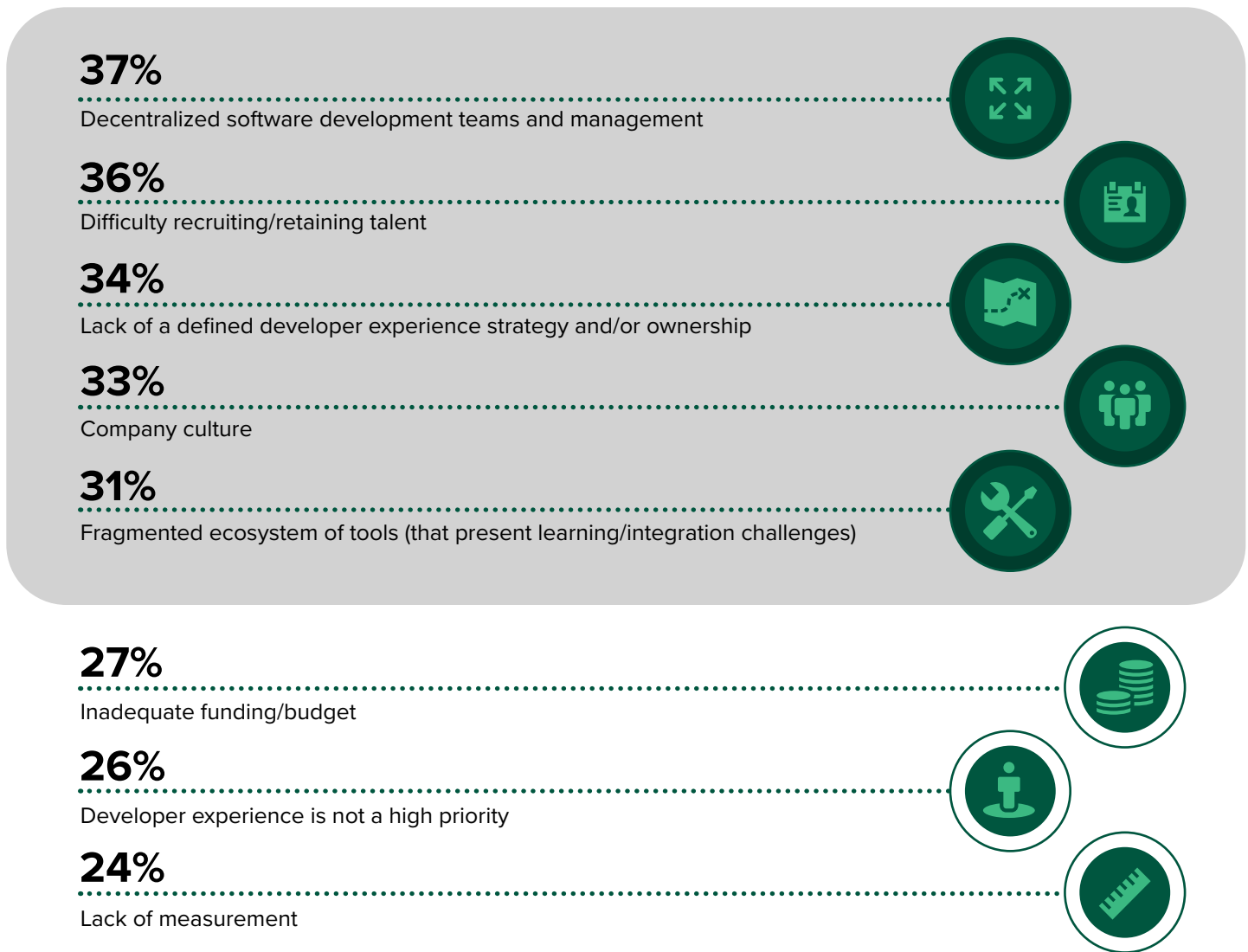Source: A commissioned study conducted by Forrester Consulting on behalf of VMware, March 2022

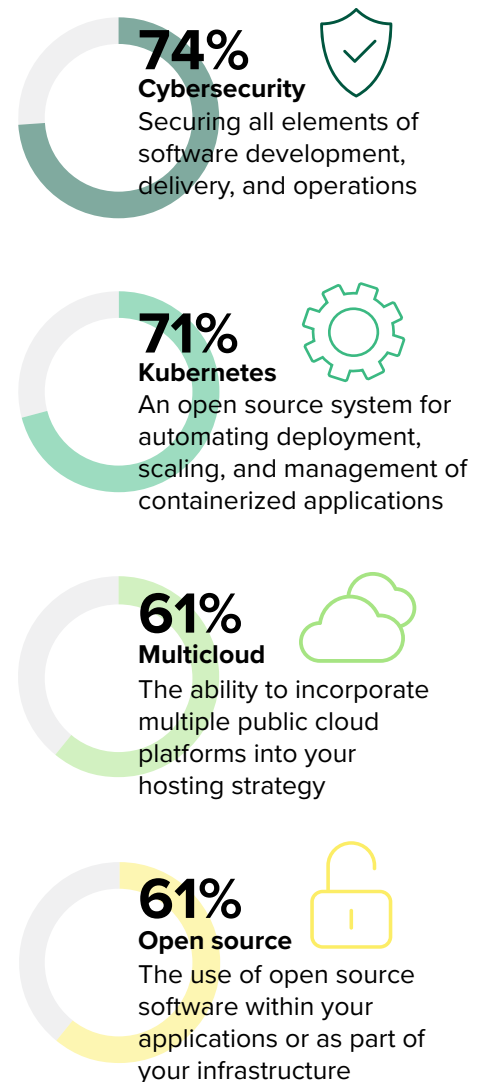## ENTERPRISE COMPLEXITY MEETS EMPATHY

Ray Ozzie, the software entrepreneur who famously created Lotus Notes, cautioned everyone over a decade ago that: "Complexity kills. Complexity sucks the life out of users, developers, and IT."[2] If few understood what Ozzie meant then, it's clear that many people do now.

- **Enterprise architecture is complicated.**
Today's enterprises eschew monolithic legacy architectures while embracing modern options, like microservices, and deploying open source software to maximize business flexibility. A robust majority of respondents believe that core technology strategies that incorporate open source, multicloud, Kubernetes, and cybersecurity tools are important or very important to executing their business strategy.

- **Complex architectures create downstream impact.** More than three in five respondents say that the complexity associated with managing open source, multicloud, Kubernetes, and cybersecurity tools inhibits their developers' productivity and experience (See Figure 5). Cybersecurity protocols, for example, may require security and operations (SecOps) testing and validation that can lead to iterative code changes and delayed releases. Even when unavoidable, delayed software product launches not only impede revenue, but they can also spur team conflict and erode developer confidence.

In a sign of growing awareness of the problem, 58% of respondents agree that their enterprise architecture complexity motivates them to work for an improved developer experience.

Figure 5

To what extent is complexity associated with managing the following inhibiting your developers' productivity and experience?

74%
Cybersecurity
Securing all elements of software development, delivery, and operations

71%
Kubernetes
An open source system for automating deployment, scaling, and management of containerized applications

61%
Multicloud
The ability to incorporate multiple public cloud platforms into your hosting strategy

61%
Open source
The use of open source software within your applications or as part of your infrastructure

Base: 651 global IT/engineering and LOB decision makers with knowledge of their organizations' developer experience
Note: Showing "Moderately inhibiting" and "Significantly inhibiting" responses
Source: A commissioned study conducted by Forrester Consulting on behalf of VMware, March 2022

- **Leaders need greater insight to move forward.** Seventy-one percent of responding business and LOB leaders concede that they need to better understand and support the application development and delivery process. Developers may view that educational process as a formative step toward improving their experience.

A good developer experience reduces manual work and automates basic tasks.

- Manager-level retail IT/engineering leader, U.K.

A DevEx assessment marks a snapshot in time derived from objective and subjective perceptions. There's no single action that will prevent or solve every possible concern. From training to compensation to self-service portals, organizations try numerous ways to invest in improving DevEx.
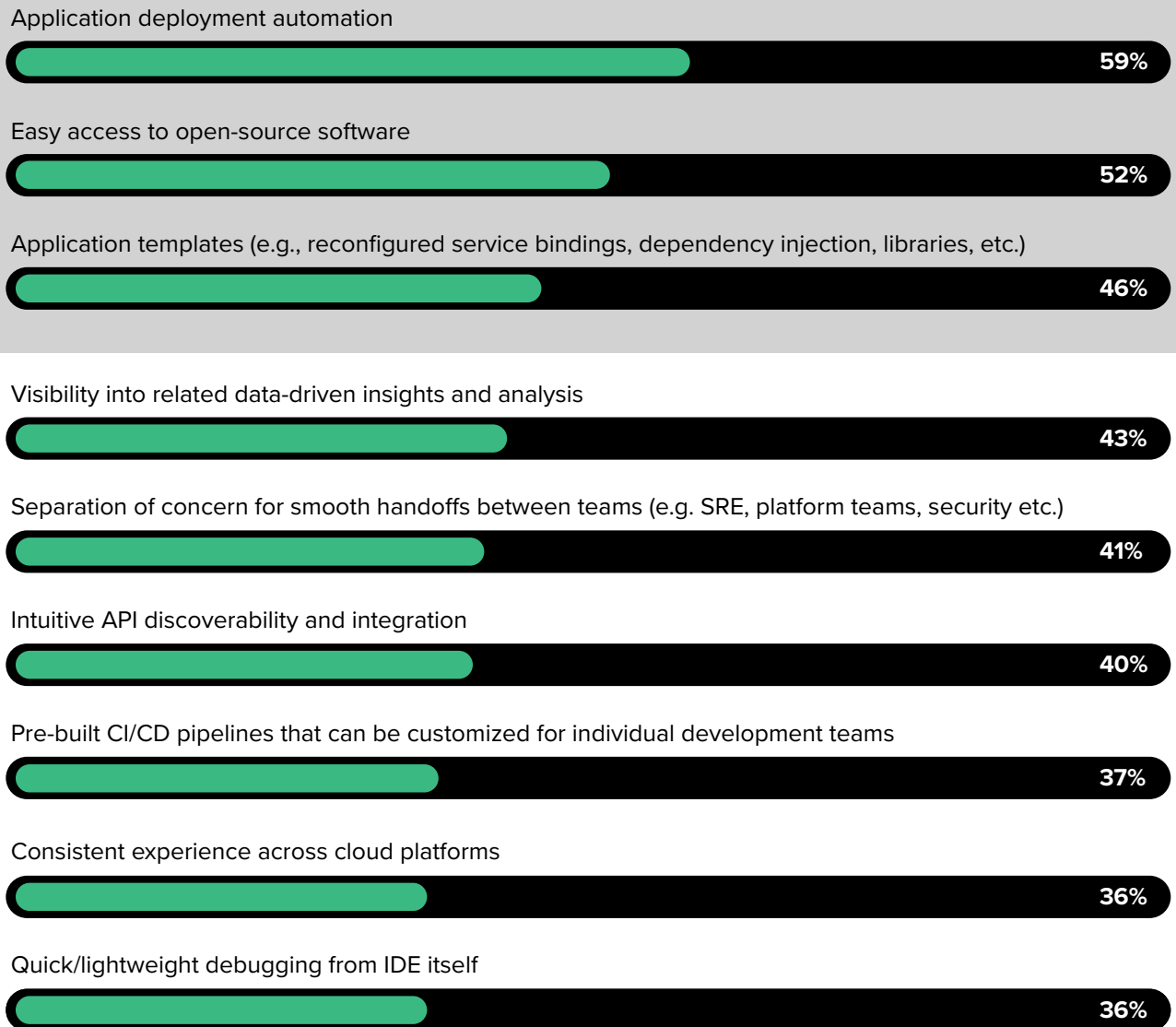
There is a unified strategy driving these investments, with nearly three in five respondents saying the most crucial consideration is reducing friction in team processes. Deploying tools that automate handoffs or accelerate debugging can help accomplish that objective.

When organizations are justifying DevEx investments, they should consider their company-wide effects. These solutions can also help drive faster software release cycles, allowing companies to realize benefits such as shorter time-to-revenue or higher Net Promoter Score[SM] ratings from a better customer experience.[3]

- **Capabilities that move the needle.** How can firms make work a more positive experience for their developers? As organizations look to reduce friction and complexity in development processes, respondents believe specific solution capabilities, particularly application deployment automation, easy access to open source software, and application templates, would make a significant difference (See Figure 6).

- **Stepping up to improve DevEx.** There's no universally adopted action, but nearly half of all respondents invest in developer training and self-service portals. In a nod to improving support for remote/hybrid workers, 45% of respondents' organizations are investing in collaborative communication tools and platforms. On average, respondents' organizations have implemented three initiatives, but only one in three say they are investing in (or raising) developer compensation.

Figure 6

Which of the following capabilities, if any, would have a significant positive impact on your developers' experience?

Application deployment automation

59%

Easy access to open-source software

52%

Application templates (e.g., reconfigured service bindings, dependency injection, libraries, etc.)

46%

Visibility into related data-driven insights and analysis

43%

Separation of concern for smooth handoffs between teams (e.g. SRE, platform teams, security etc.)

41%

Intuitive API discoverability and integration

40%

Pre-built CI/CD pipelines that can be customized for individual development teams

37%

Consistent experience across cloud platforms

36%

Quick/lightweight debugging from IDE itself

36%

- **Anticipating positive returns.** Most firms expect a positive return on their developer experience investments. Although fewer than one in three respondents describe their efforts as mature, more than 70% have realized a return on developer-focused investments. Training, open source usage policies, and self-service portals are the areas most likely to generate a higher than expected return.

- **Investments are starting to pay off.** A majority of respondents consider DevEx improvements a worthwhile endeavor. While many of their organizations are still in the early stages of their journey, about half of respondents have already seen revenue growth, enhanced developer productivity, and developer job satisfaction improvements from their DevEx investments (See Figure 7).

- **Spending is expected to rise.** Respondents' investment plans reflect the value they see in strengthening their developers' experience. Over the next year, 91% expect their organization to maintain or increase their DevEx investment, while fewer than 9% anticipate a spending decrease. However, some developer experience investments may not be visible given the decentralized nature of many software development teams. To drive a common understanding of strategy and investments, firms may want to improve their lines of communication with developers and unify similar efforts that may be taking place across siloed groups.
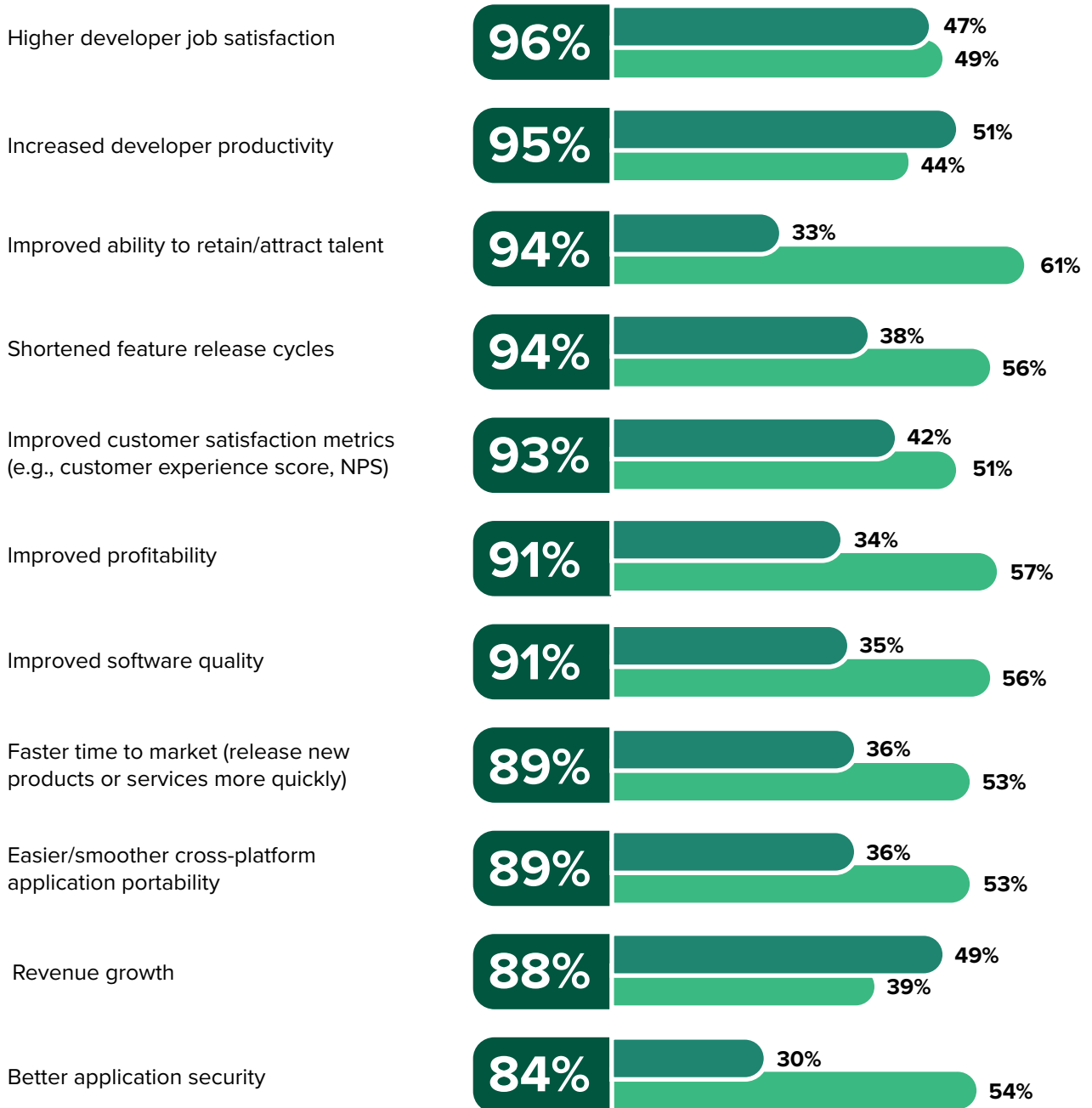
Investments that fall under DevEx typically serve multiple business objectives. Reducing friction in team processes is an important objective, but perhaps the bigger picture is a heightened awareness that investing in developers, including their tools and processes, drives more productive and successful business operations.

Figure 7

What benefits, if any, has your organization already realized, or does it expect to realize, as a result of its developer experience improvement efforts/investments?

● Realized benefit   ● Expected benefit

Higher developer job satisfaction
96% 47% 49%

Increased developer productivity
95% 51% 44%

Improved ability to retain/attract talent
94% 33% 61%

Shortened feature release cycles
94% 38% 56%

Improved customer satisfaction metrics (e.g., customer experience score, NPS)
93% 42% 51%

Improved profitability
91% 34% 57%

Improved software quality
91% 35% 56%

Faster time to market (release new products or services more quickly)
89% 36% 53%

Easier/smoother cross-platform application portability
89% 36% 53%

Revenue growth
88% 49% 39%

Better application security
84% 30% 54%

Key Recommendations

Improving the developer experience can impact the quality of software, its velocity, and, ultimately, its profitability. In addition, an improved developer experience can lead to higher developer job satisfaction, so it follows that focusing on DevEx is one of the best investments a company can make.

Forrester's in-depth survey of 651 global IT and LOB leaders about the value of the DevEx yielded several important recommendations:

Uncover developer experience obstacles.

Randomly making changes to your software delivery tool chain will only create chaos. Instead, consider creating a value stream map to uncover software development speedbumps, manual handoffs, and, most importantly, where friction exists within the software delivery process.[4] Chances are you will find a combination of process- and technology-related issues and a baseline from which to improve. With your value stream map, you can create a strategy that focuses on the highest impact changes first.

Expand the use of automation.

Automation in the form of DevOps tools and capabilities has had a profound impact on both the reliability of software delivery as well as the ability to restore sanity to developers' lives, so it's no surprise that application deployment automation was listed as the top capability expected to improve developers' experiences. Do away with weekend deployments and war rooms by adopting deployment automation to enable weekday deployments with confidence and peace of mind.

Include access to open source.

Open source software has been a critical force in driving innovation throughout the software industry. Yet open source itself is undergoing fundamental change with new licenses and new threats.[5] That's why it's crucial to provide your developers with access to a curated set of open source software products and components that can be trusted and that have a strong community to support them.

Use application templates to get a jump start.

For many developers, getting started is the hardest part. A developer experience which includes application templates for configuring services, managing dependencies, or access to libraries goes a long way toward helping developers not only get a jump start, but get moving in the right direction so that they can start delivering value sooner.

Appendix A: Methodology

In this study, Forrester conducted a global online survey of 651 decision makers from retail, public sector, healthcare, financial services, manufacturing, media/leisure, telecom, and energy/utility organizations to evaluate the business value of having a good developer experience. Survey participants included manager and above decision-makers from the business as well as IT/engineering teams with knowledge of their organizations' developer experience. Questions provided to the participants asked about the impact their developers have on the organizations' ability to execute their business strategy, obstacles to their developers' productivity and experience, and benefits of developer experience improvements. Respondents were offered a small incentive as a thank you for time spent on the survey. The study fielding began and was completed in March 2022.

Appendix B: Demographics

COUNTRY	
United States	**17%**
Canada	**15%**
United Kingdom	**10%**
Germany	**9%**
France	**9%**
India	**9%**
China	**8%**
Australia/New Zealand	**8%**
Japan	**8%**
The Netherlands	**8%**

REGION	
North America	**31%**
Europe	**36%**
Asia Pacific	**33%**

COMPANY SIZE (NO. OF EMPLOYEES)	
1,000 to 4,999	**47%**
5,000 to 19,999	**36%**
20,000 or more	**17%**

INDUSTRY	
Retail	**17%**
Healthcare	**16%**
Financial services	**16%**
Manufacturing	**16%**
Public sector	**16%**
Media/leisure	**7%**
Telecom	**7%**
Energy/utilities	**6%**

SENIORITY	
C-level	**11%**
Vice president	**14%**
Director	**27%**
Manager	**48%**

DEPARTMENT	
IT/engineering	**80%**
LOB	**20%**

Note: Some percentages may not add up to 100% due to rounding

Appendix C: Supplemental Material

RELATED FORRESTER RESEARCH

"Align Strategy And Technology To Deliver Next-Gen Personalization," Forrester Research, Inc.,
September 2, 2020.
"The Future Of Enterprise Marketing Technology," Forrester Research, Inc., November 25, 2020.

Appendix D: Endnotes

[1] Source: "Digital Transformation Requires Development Transformation," Forrester Research, Inc., December 29, 2020.
[2] Source: Gregg Keizer, "Ozzie's 'doomsday' memo warns Microsoft of post-PC days," Computerworld, October 26, 2010 (https://www.computerworld.com/article/2513705/ozzie-s--doomsday--memo-warns-microsoft-of-post-pc-days.html).
[3] Net Promoter, NPS, and the NPS-related emoticons are registered U.S. trademarks, and Net Promoter Score and Net Promoter System are service marks, of Bain & Company, Inc., Satmetrix Systems, Inc. and Fred Reichheld.
[4] Source: "Get MAD With Value Stream Management," Forrester Research, Inc., February 19, 2020.
[5] Source: "Log4j, Open Source Maintenance, And Why SBOMs Are Critical Now," Forrester Research, Inc., December 15, 2021.