FORRESTER®

Unlocking Multicloud's Operational Potential

Centralize And Automate Your Cloud Platform To Increase Operational Efficiency And Security

A FORRESTER CONSULTING THOUGHT LEADERSHIP PAPER COMMISSIONED BY HASHICORP, JULY 2022

Table of Contents

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ABOUT FORRESTER CONSULTING

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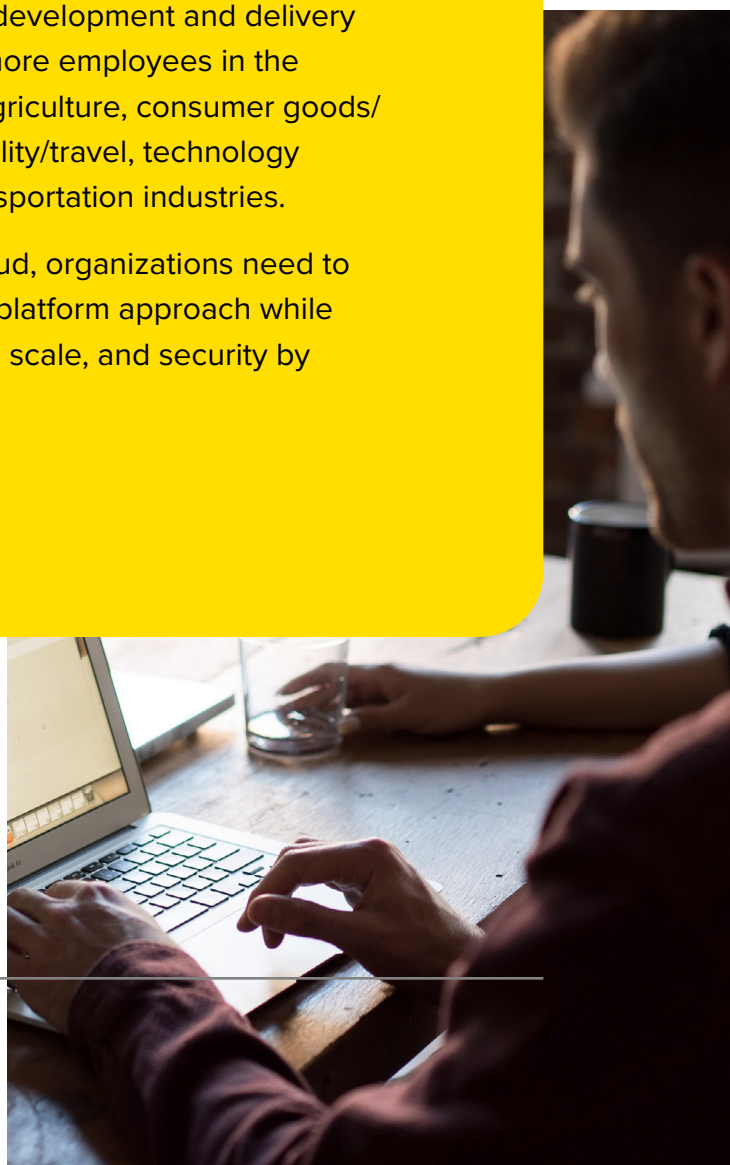
Executive Summary

Multicloud is the most pervasive form of cloud strategy that practitioners and decision-makers choose, and it's growing. Firms choose to operate with multicloud because it is a reliable, scalable platform with which to digitally transform. However, operational risks can inhibit these complex cloud environments from reaching their full potential. Data security, skills shortages, and lack of centralized operational responsibility or budgetary insight are some of the critical challenges in optimizing multicloud operations.

To address these challenges, firms must invest in developing centralized platform teams — specific cloud groups responsible for carrying out multicloud operations and developing best practices, security policies, and aligning internal assets (people and processes) throughout the organization.

In January 2022, HashiCorp commissioned Forrester Consulting to understand the current state of multicloud operations, along with the drivers, challenges, benefits, and opportunities for those using it. Forrester conducted an online survey with 1,039 application development and delivery professionals who work at companies of 1,000 or more employees in the financial services, healthcare/biotech, education, agriculture, consumer goods/retail, energy/utilities, media/entertainment, hospitality/travel, technology software or services, telecommunications, and transportation industries.

We found that to unlock the full benefits of multicloud, organizations need to holistically align and standardize operations with a platform approach while allocating critical resources to increase automation, scale, and security by using the right technology approaches and tools.



Key Findings

Multicloud use continues to grow. Today, 60% of surveyed technology practitioners and decision-makers are using multicloud. In the next 12 months, that number will swell to 81%. A majority of respondents (90%) say that it is helping them achieve business goals.

Operational complexity creates multiple challenges. Eighty-nine percent of respondents agree that security is the most critical determinant of success for a cloud strategy, and this is exacerbated by multicloud environment complexity. Thirty-one percent ranked complexity as the most significant internal challenge to cloud security.

Centralized functions can tame multicloud operations, but platform teams are needed to execute them. Cloud functions (e.g., cloud centers of excellence [CCoE], platform teams) are responsible for standardizing cloud services (87%), creating operational policies (86%), and centralizing security (85%). However, to mitigate people- and process-themed challenges like skills shortages (41%) and siloed teams (35%), organizations require platform teams with operational responsibility to implement these centralized functions.

Infrastructure automation tools are a catalyst for boosting operational efficiency. Eighty-nine percent of respondents agreed that automation is important — 58% said extremely important — to operationalizing multicloud infrastructure, and organizations are choosing to buy it instead of building it from scratch. Automation is helping to optimize cost and scale operations.

Multicloud Is Everywhere, But Operational Issues Threaten To Limit Its Potential

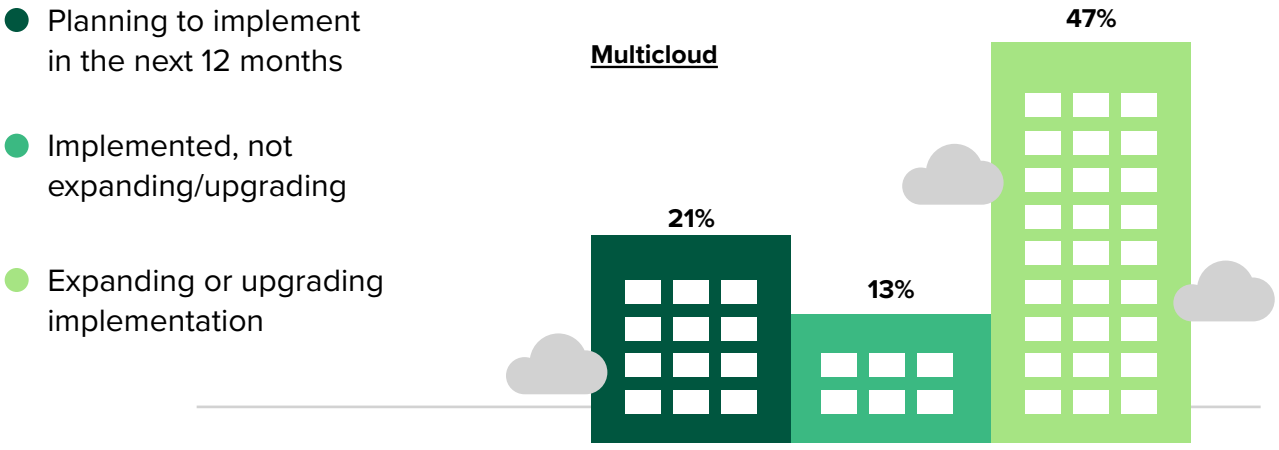
Multicloud has become the go-to cloud strategy for organizations across industries including healthcare, financial services, retail, and more. Technology practitioners and decision-makers are choosing multicloud to meet their business objectives because it's a reliable and scalable technology that fuels digital transformation. To create standardization around multicloud, organizations are establishing centralized functions (e.g., platform teams).

After surveying 1,039 technology practitioners and decision-makers about the current state of their cloud strategy, we found that:

- **Multicloud is everywhere, and it's providing value.** Today, 60% of surveyed practitioners and decision-makers are using multicloud and 47% are expanding their use of it (see Figure 1). The rate of multicloud expansion is even higher for large North American technology companies with more than 5,000 employees, where more than half of respondents are expanding their footprint (51%). Most importantly, perhaps, is that 90% of responding multicloud users say that it is helping them achieve their business goals (see Figure 2).

Figure 1

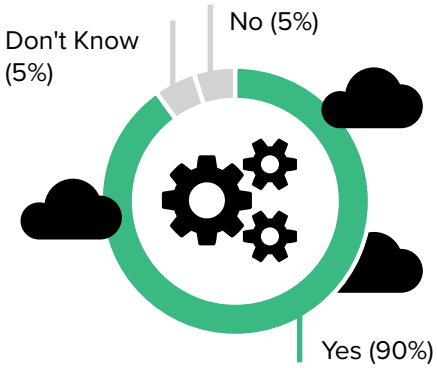
"Which of the following describes your organization's multicloud strategy?"



Base: 1,039 application development and delivery decision-makers with budget authority for new investments
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

Figure 2

"Has a strategy to use multiple clouds helped to advance or achieve your company's business goals?"

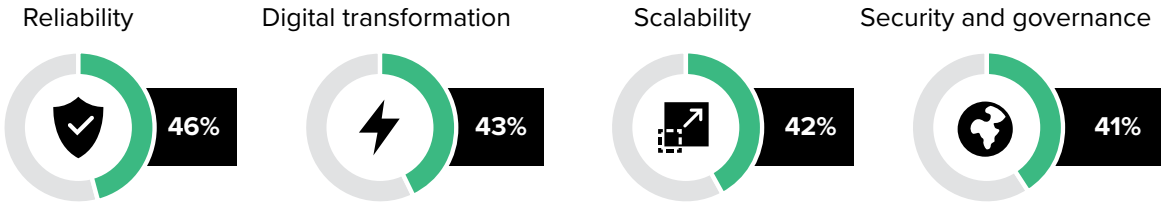


Base: 651 application development and delivery decision-makers with budget authority for new investments who have implemented a multicloud strategy
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

- **Technology decision-makers rely on multicloud to align critical areas of their business.** Reliability (46%), digital transformation (43%), scalability (42%), and security and governance (41%) are the top reasons for firms to develop multicloud operations (see Figure 3). Technology leaders are using multicloud to support critical aspects of their business. However, their expectations and possible results are often inhibited by complex multicloud operations.

Figure 3

"What are the business and technology factors driving your multicloud adoption?"



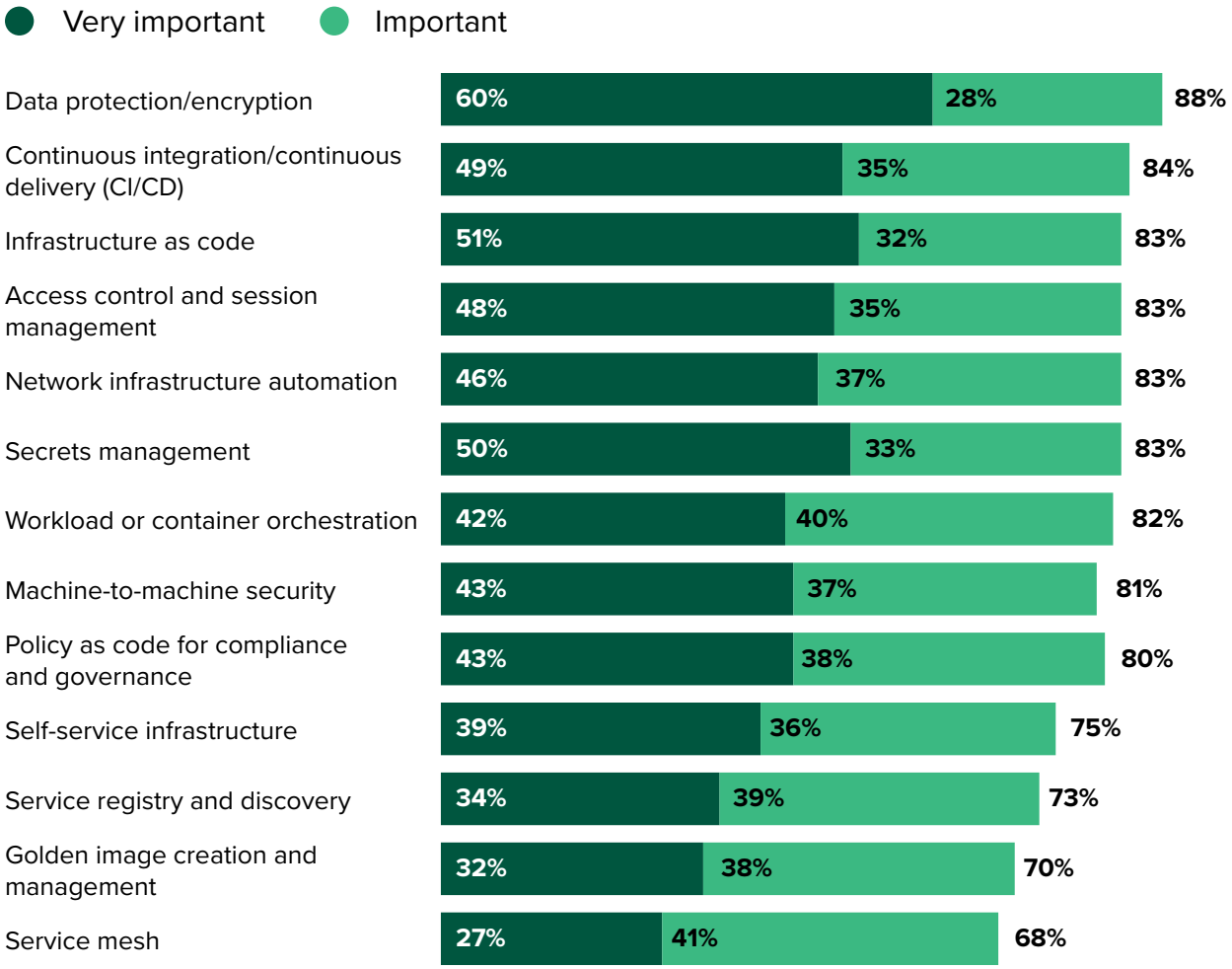
Base: 874 application development and delivery decision-makers with budget authority for new investments
Note: Respondents selected all responses that applied
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

- **Firms are investing in platform teams, but they must be executed effectively.** Eighty-six percent of organizations have implemented a centralized function — an organizational hub/knowledgebase such as a platform team or a CCOE — within their organization for proselytizing and managing their multicloud operations. These functions are responsible for standardizing cloud services (87%), distributing best practices (86%), creating operational policies (86%), and centralizing security (85%).

- **Multicloud success hinges on security controls, CI/CD, and infrastructure tools.** Organizations prioritize data protection and encryption (88%) as their most important technology tool/initiative, followed by continuous integration/continuous delivery (CI/CD) (84%), infrastructure as code (83%), and infrastructure automation (83%) (see Figure 4). Eighty-nine percent of respondents say that security is the ultimate determinant of success for a cloud strategy.

Figure 4

"How important are each of the following tools/initiatives to the success of your cloud strategy?"



Base: 1,039 application development and delivery decision-makers with budget authority for new investments
Note: Total percentages may not equal separate values due to rounding
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

Operational Complexity Can Create Challenges for People, Process, Budget, and Security

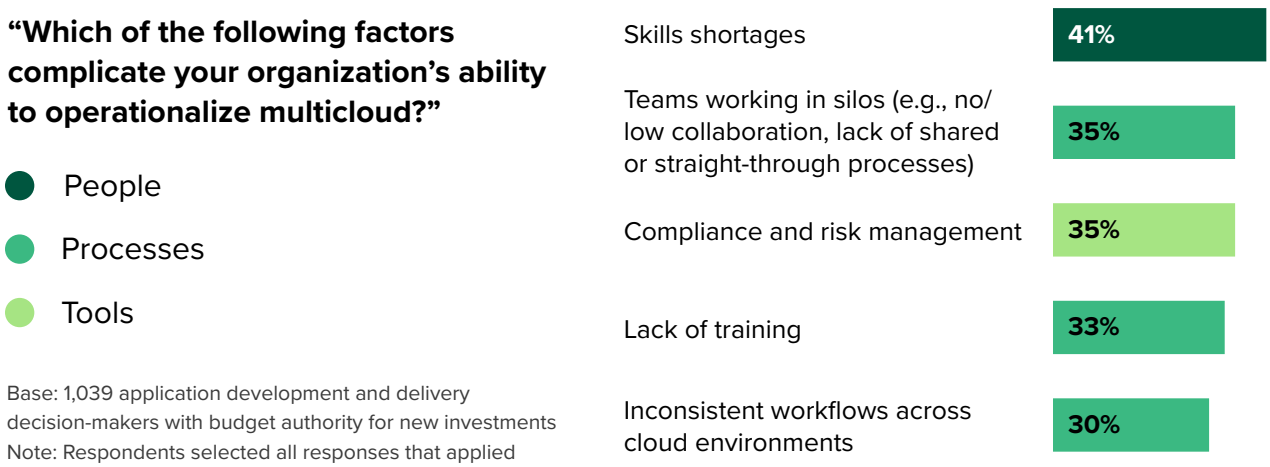
Multicloud is helping IT decision-makers accomplish their business goals, but the complexity of managing multiple technologies, applications, and APIs, as well as developing processes around them, breeds operational challenges. Without a centralized approach to managing complex multicloud operations, skills shortages, siloed teams, and other factors can exacerbate security risks.

Here is what we found after surveying technology practitioners and decision-makers about the challenges of their multicloud operations:

- **Siloed teams, lack of skills, and inconsistent workflows could limit multicloud potential.** Technology practitioners and decision-makers cite skills shortages (41%) as the number one factor impacting multicloud operations, followed by siloed teams (35%), lack of training (33%), and inconsistent workflows across cloud environments (30%). People and process issues like these, as opposed to technology issues, are suppressing organizations' potential for efficient multicloud operations (see Figure 5). Respondents say they plan to resolve these issues by standardizing and centralizing on a common operating model (59%), upskilling through certifications and education (53%), and forming closer partnerships with system integrator (SI) partners and consultants (49%).

Figure 5

"Which of the following factors complicate your organization's ability to operationalize multicloud?"

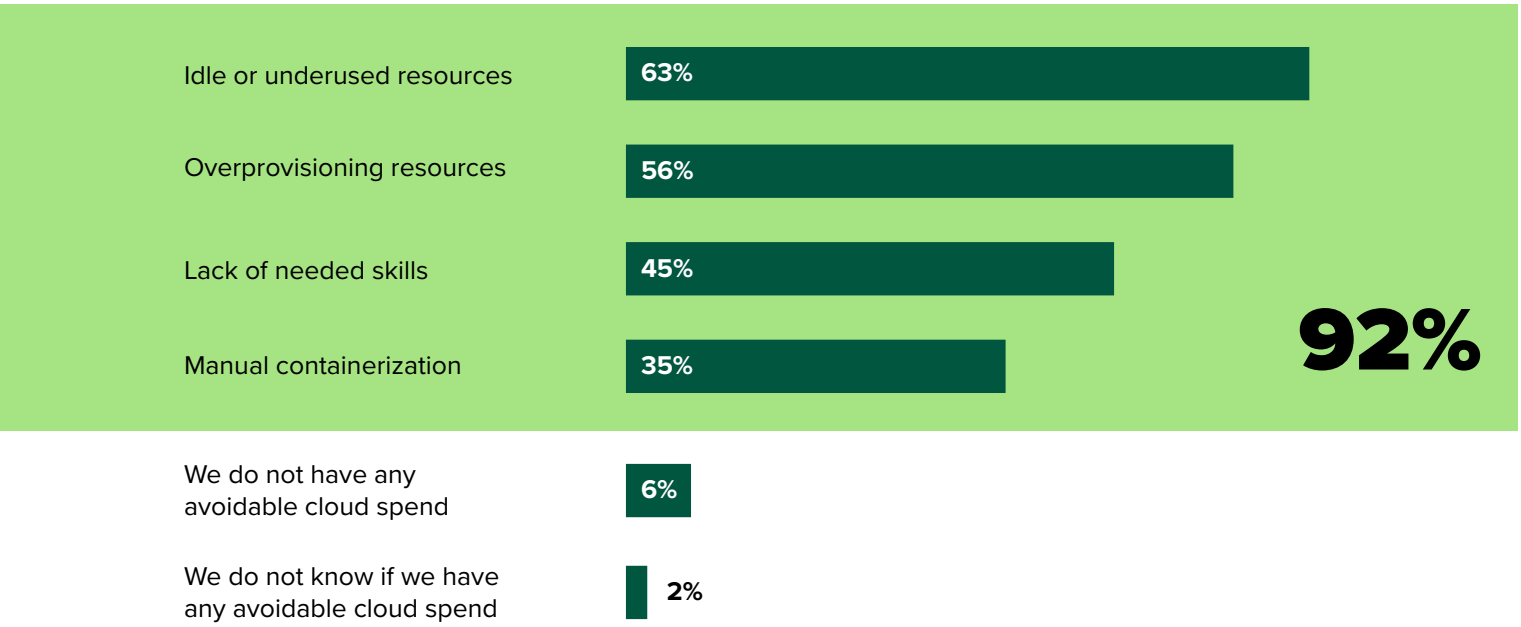


Base: 1,039 application development and delivery decision-makers with budget authority for new investments
Note: Respondents selected all responses that applied
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

- **Avoidable cloud spend and lack of resource management raise potential challenges.** Ninety-two percent of all respondents with budget authority for new investments acknowledged having avoidable cloud spend at their organization, with small differences across the North America (92%), APAC (95%), and EMEA (90%) regions. The primary cause of avoidable cloud spend is idle or underused resources (63%), followed by overprovisioning of resources (56%) and lack of required skills (45%) (see Figure 6). In addition, one in four organizations (24%) surpassed their annual projected cloud spend. This highlights the importance of centralization and alignment on budget planning from a holistic level.

Figure 6

"Which of the following factors contribute to avoidable cloud spend, also known as cloud waste, at your organization?"

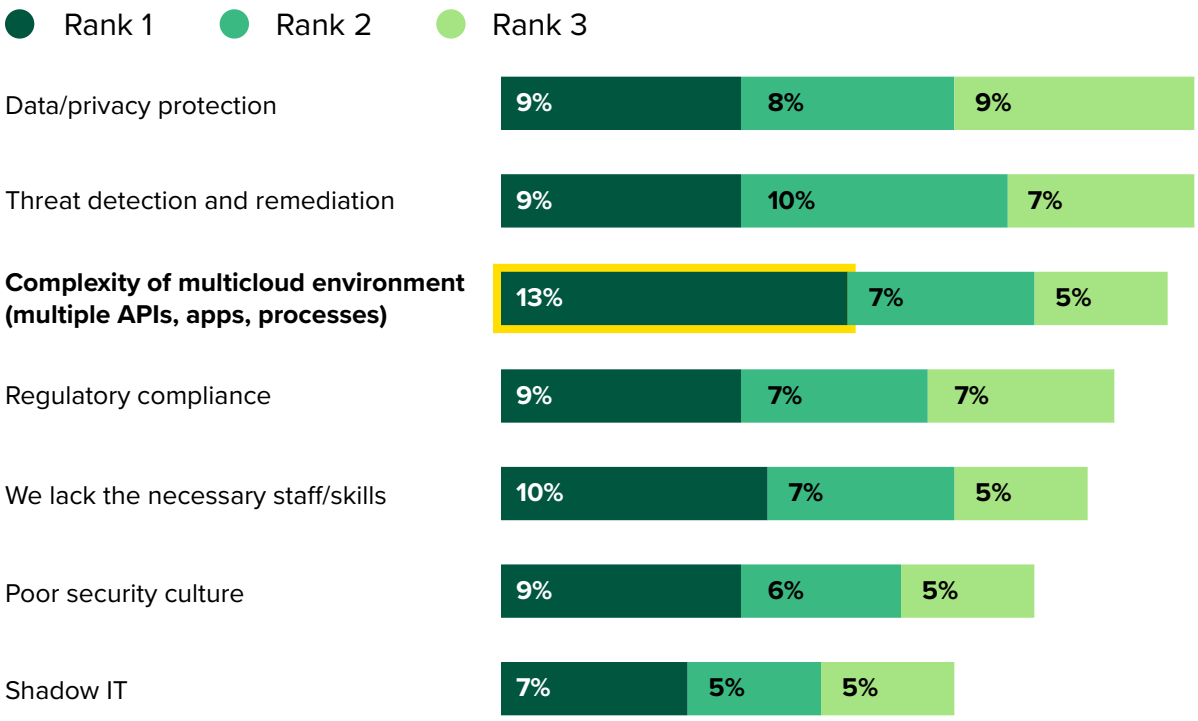


Base: 1,039 Application development and delivery decision-makers with budget authority for new investments
Note: Respondents selected all responses that applied
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

- **Data security issues are exacerbated in heterogenous multicloud environments.** Complexity of multicloud environment (31%) was ranked the most significant internal challenge to cloud security (see Figure 7). Differences in operational and security controls amongst public cloud providers have implications for defending from security threats. Respondents ranked data theft (41%) as the largest external threat to their security, right next to ransomware (39%) phishing/social engineering attacks (38%), and password credential/secrets leakage (37%) (see Figure 8).

Figure 7

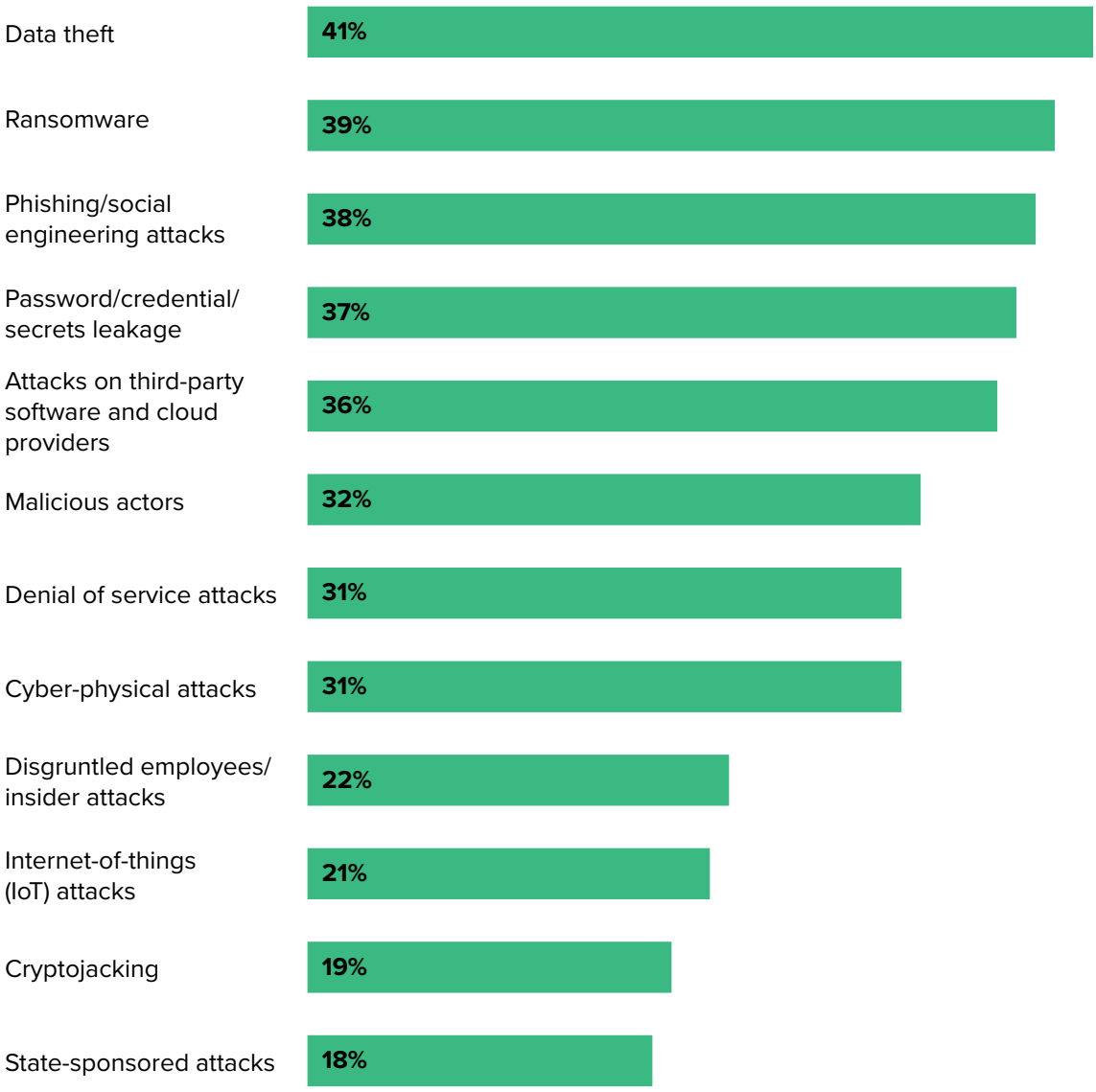
"Please rank the top 5 internal challenges you've selected, with 1 being the biggest challenge."



Base: 1,039 Application development and delivery decision-makers with budget authority for new investments
Note: Respondents selected their top 5 challenges; only displaying top 7 responses.
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

Figure 8

“What are the biggest threats that your organization faces when it comes to cloud security?”



Base: 1,039 application development and delivery decision-makers with budget authority for new investments
Note: Respondents selected all responses that applied
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

Centralizing Multicloud Operations Requires Technology That Enables Efficiency and Scale

Multicloud environments come with their own set of challenges, such as inconsistencies in controls, skillsets, and technologies. Organizations will need to find the right tools to streamline and standardize operations.

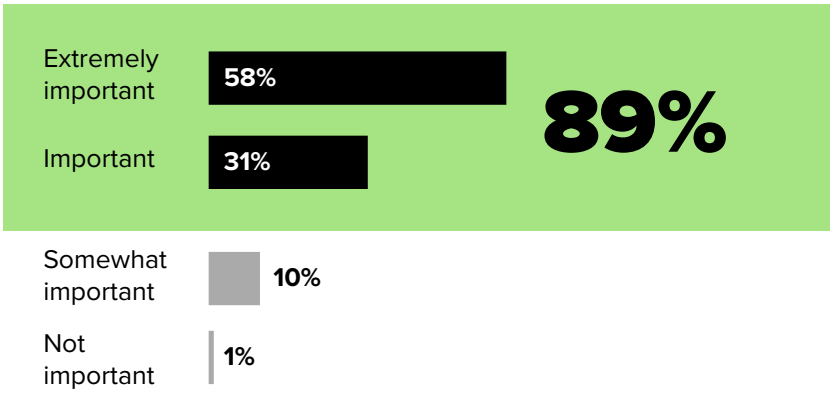
Solving for critical operational challenges and becoming future fit by avoiding waste, reducing complexity, and limiting budget losses will require organizations to leverage infrastructure automation tools and decide whether to buy and run solutions themselves, buy as a service, or build from scratch.[1]

Here is what we found by surveying respondents about opportunities for their multicloud operations:

- **Automation is a pillar of operational excellence.** Eighty-nine percent of respondents agreed that automation is important — 58% of respondents said extremely important — to operationalizing multicloud infrastructure (see Figure 9). This paints a picture of how beneficial it is for organizations to enable scale and efficiency with automation. This strategy proves itself in more flexible IT infrastructure (47%), improved security and governance (46%), and better utilization of cloud resources (43%), which were cited as the top three benefits of automation tools in operationalizing multicloud.

Figure 9

"How important are automation tools for your organization to operationalize your multicloud infrastructure?"



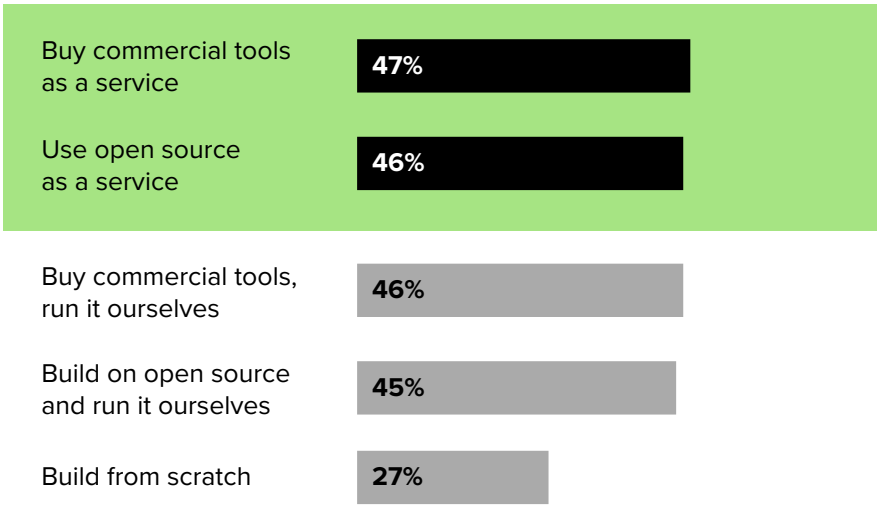
Base: 1,039 application development and delivery decision-makers with budget authority for new investments
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022

- **Technology decision-makers prefer to outsource automation tools instead of building them.** When asked how they currently use or plan to use multicloud infrastructure automation, most technology decision-makers (respondents in managerial roles) favor buying automation tools as a service (51%), with 46% saying that they would use open-source tools as a service. In comparison, only 23% would consider building tools themselves from scratch (see Figure 10). Buying or using technology as a service allows organizations to focus on their core competencies and conserve resources by outsourcing tasks technology vendors do well.

Figure 10

"For multicloud infrastructure automation tools, what kind of offering does your organization currently use or plan to use?"

Base: 1,039 application development and delivery decision-makers with budget authority for new investments
Source: A commissioned study conducted by Forrester Consulting on behalf of HashiCorp, June 2022



- **Multicloud operation tools help organizations work smarter, not harder.** The number one benefit that respondents' organizations look for from tools or solutions to manage their multicloud operating strategy is cost optimization (42%), which, along with other top benefits like scalability (39%), developer productivity (37%), and automated workflow-enabled operations (36%), is aimed at improving efficiency and streamlining operations. Those that have implemented these tools and solutions have already realized benefits that directly align with these goals; chief among them are scalability (49%) and cost optimization (40%).
- **Opportunities exist to fill unsolved security gaps.** There is still room to mature in terms of boosting security measures through technology tools. Secret centralization (29%) and zero trust security (28%) are the biggest opportunities for improvement on the list of realized benefits from using tools or solutions. They also ranked low in importance on a list of sought-after technology benefits (33% for secret centralization and 32% for zero trust security).

Key Recommendations

You need to get specific about your multicloud plan and goals as your organization makes the leap into public clouds and address the complex sourcing critical to supporting your infrastructure. Forrester's in-depth survey of 1,039 application developers and infrastructure leaders about multicloud yielded several important recommendations:

Tailor your multicloud strategy to your business goals.

Succeeding in multicloud means more than just operating in two or more clouds simultaneously. Multicloud comes in many forms, like different apps in respective clouds, an app with different parts of the stack in multiple clouds, or a single app simultaneously running in multiple clouds. You decide which multicloud approaches you're targeting, and which are out of scope for you. Ask yourself what greater purpose your cloud strategy serves. What specific efficiencies — such as process and resource utilization — are you seeking for your company, and why are those important?

Automate your way to reduce waste and increase efficiency.

Visibility into cloud spend and tackling avoidable cloud usage are important steps in improving efficiencies in a multicloud world. Companies want to get cloud costs under control, but they usually find that manual methods aren't scalable. Firms can optimize resources through scheduling, identifying waste, improving budget adherence, forecasting, and more. Increasing cloud usage, along with an immediate ROI, should make the adoption of automated tools an easy and compelling choice — not just for reducing waste, but for increasing holistic efficiency.

Leverage security automation tools to support multicloud operations.

For cloud platforms, the integration of CI/CD pipelines, identity and credential management of administrators, cloud instances, and infrastructure elements are often quick to configure — but they're also easy to misconfigure. Cloud security is easier and less expensive to manage using automated tools. Firms should use tools to centrally manage, enforce, and audit. Leverage automation tools that not just save your operations teams time, but also solve complex IT problems, optimize cloud costs, and detect and remediate security vulnerabilities.

Develop a platform team to cover all functional layers.

After more than a decade and a half of cloud growth, organizations are still facing a talent shortage for all cloud-related skills. Differences in cloud technologies lead to further complexity in developing expertise and team structures in multicloud environments. Organizations are exploring multiple organic ways to address this issue, particularly by building cloud platform teams that operationalize and execute on security, governance and controls, policies and frameworks, internal trainings, cloud certifications, and more across the organization. They are finding that culture is equally important as training, and efforts to develop skills will not be as effective without a supportive learning culture.

Appendix A: Methodology

In this study, Forrester conducted an online survey of 1,039 application development and delivery practitioners and decision-makers at financial services, healthcare/biotech, education, agriculture, consumer goods/retail, energy/utilities, media/entertainment, hospitality/travel, technology software or services, telecommunications, and transportation organizations. Respondents' organizations had more than 1,000 employees in North America, EMEA, and APAC and were creating a successful roadmap for implementing a multicloud strategy. Study participants included decision-makers with budget authority for new investments, which could include enterprise architects, business process management titles, and IT roles. Questions provided to the participants asked about current cloud strategy, use of centralized cloud functions, cloud spend, challenges and opportunities related to multicloud operations. Respondents were offered a small incentive as a thank you for time spent on the survey. The study began in March 2022 and was completed in June 2022.

Appendix B: Demographics

REGION	
North America	**37%**
EMEA	**33%**
APAC	**30%**

TOP INDUSTRIES	
Tech/tech services	**27%**
Finserve/insurance	**16%**
Manufacturing	**7%**
Retail	**6%**
Healthcare	**5%**
Telco services	**5%**

TOP POSITIONS	
DevOps engineer (14%)	**14%**
Cloud architect (10%)	**10%**
Cloud engineer (7%)	**7%**
Solution architect (6%)	**6%**
Developer (5%)	**5%**
Site reliability engineer (5%)	**5%**

COMPANY SIZE (EMPLOYEES)	
15,000+	**30%**
8,000 to 14,999	**13%**
5,000 to 7,999	**17%**
2,000 to 4,999	**22%**
1,000 to 1,999	**18%**

LEVEL	
Practitioner	**68%**
Director+	**32%**

RESPONSIBILITY	
Primarily responsible for organization's cloud strategy	**24%**
Shares primary responsibility with a small group for my organization's cloud strategy	**25%**
Provides input for organization's cloud strategy	**34%**
Responsible for executing on company's cloud strategy, but does not provide strategic input	**16%**

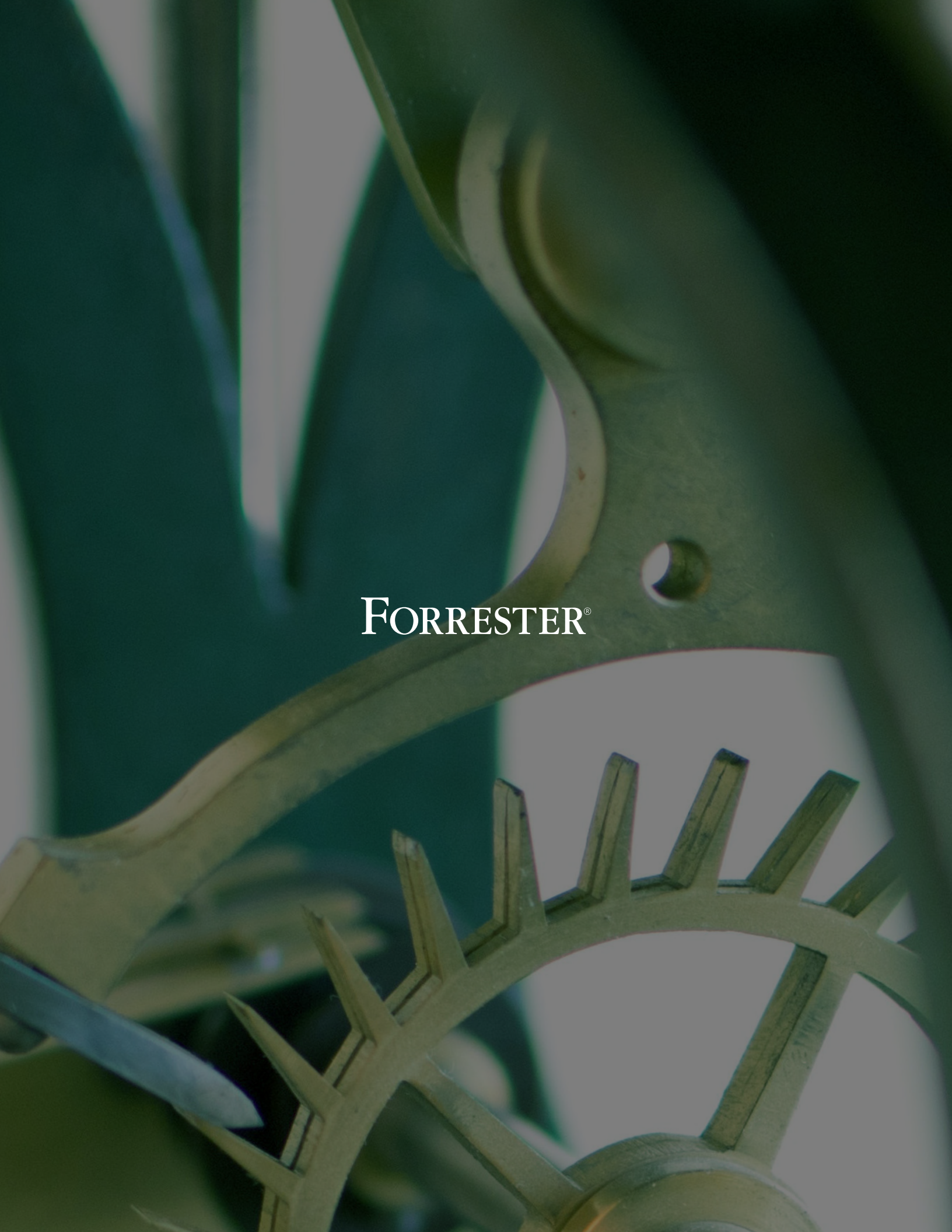
Appendix C: Supplemental Material

RELATED FORRESTER RESEARCH

"Optimize Your Technology Stack to Become Future Fit," Forrester Research, Inc., March 29, 2022.

Appendix D: Endnotes

[1] Source: "Optimize Your Technology Stack to Become Future Fit," Forrester Research, Inc., March 29, 2022.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