



State of Cloud

Q3 2022

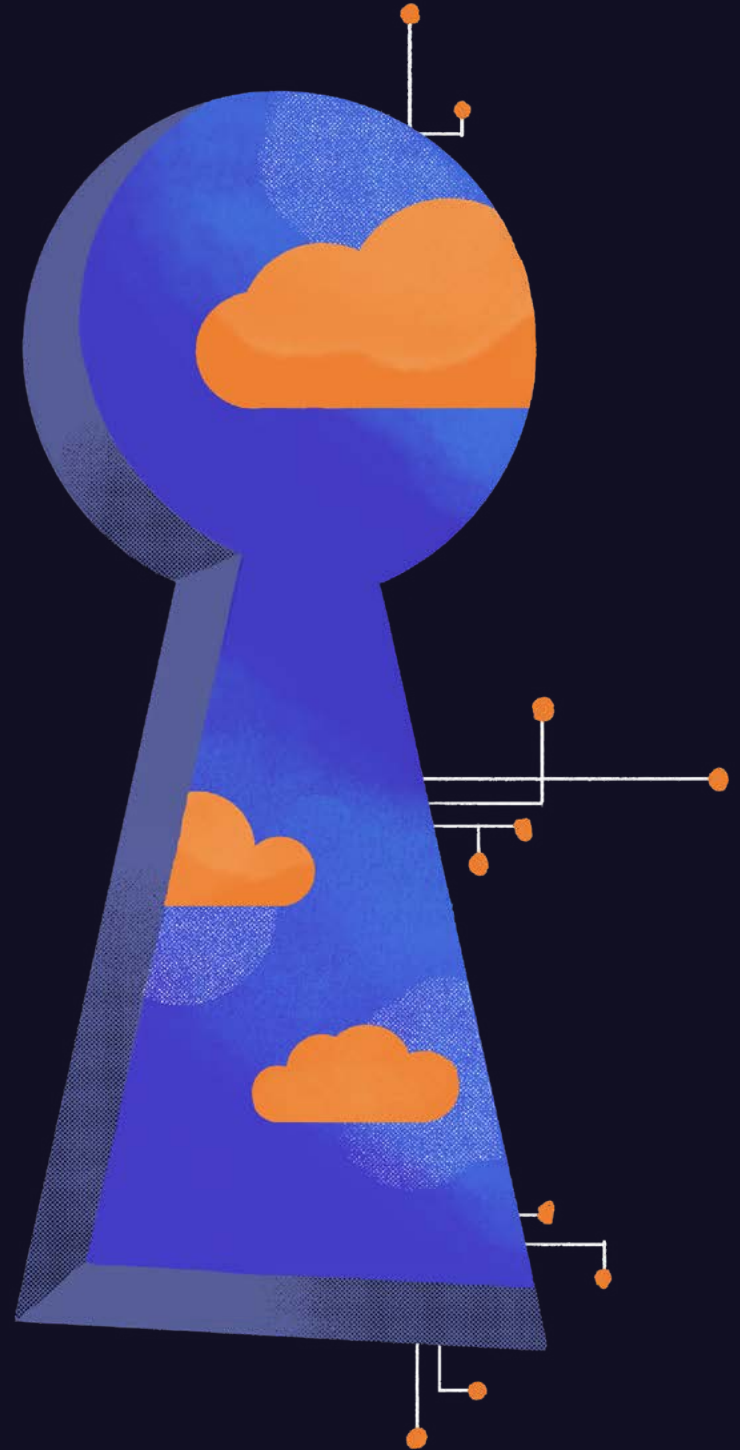


Table of contents

Executive summary	3
I. The cloud computing chasm	4
Expectation vs. reality	4
II. The 2022 State of Cloud survey	8
III. Leadership perspective: To infinity and beyond	9
IV. The cloud learner point of view: Confidence and time are key	16
V. Success: This is what it looks like	23
VI. Take the next step to cloud transformation	25

Executive summary

We blind surveyed 1,000 tech leaders and technologists across industries and throughout the world to get a clear picture of the present state of cloud computing and the expectations for the future. Equipped with the data and insights from this report, your organization can close cloud skills gaps, reduce security risks, and successfully build your future in the cloud.

MAJOR TAKEAWAYS

- 75% of leaders are building new products and features in the cloud, but only 8% of technologists have extensive experience working with cloud-related tools.
- 64% of learners are new to the cloud and looking for basic training.
- 62% of leaders implement the latest technologies as soon as they're available.
- Employees are 94% more likely to stay with a company that invests in their skill development.
- 71% of learners prefer daily or weekly learning opportunities, and 64% prefer to learn by doing with hands-on tools like labs and sandboxes.

I. The cloud computing chasm

Expectation vs. reality

75% of tech leaders say they're building all new products and features in the cloud moving forward.

But **only 8% of technologists have extensive experience working with cloud-related tools.**

Do we have your attention?

Cloud computing is no longer the future of technology. It's the present. You're already aware that cloud computing provides flexibility, scalability, improved speed to market, and countless other benefits. The myriad of benefits to organizations, including the bottom line, makes it obvious why cloud computing is the present and future of the tech world. But if you're planning on investing in the cloud, you need to also invest in cloud upskilling for your technologists who don't feel ready to deliver on those objectives.

Whether or not technologists are ready to work in the cloud (and currently, they aren't), their organizations are moving onward and upward. This evolution is exciting and promising, but it also creates concerns.

When asked about the biggest skills gap they're currently experiencing, both tech leaders and their employees stated cloud security as their number one concern. Guess what types of issues arise when your organization lacks the cloud talent to execute on your cloud infrastructure and application goals?

Security issues.



Leaders are planning their whole future in the cloud, but the teams who need to implement the processes and lay the foundation for that future are still very new to cloud computing.

This isn't a surprise as IT departments are tasked with learning an entirely new way to keep data secure. When done correctly, moving to the cloud increases security. As more businesses strive to become more cloud-mature, this takes on even greater importance.

For the executives and directors we surveyed for this State of Cloud report, it's table stakes that their development moving forward will be done within the cloud. This is consistent with our [2022 Tech Forecast report](#) that cites cloud maturity, not just adoption, as essential tech advancement. **It's not enough to migrate existing data or features to the cloud; leadership expects new development to be fully done within the cloud.**

Leaders state they're defaulting to the cloud, but Google search terms reveal that users are still trying to understand how to transition to the cloud. Users search for cloud transitional phrases tens of thousands of times per month.

[Gartner states](#) that by 2025, 85% of organizations will be "cloud first," which aligns with survey data Pluralsight ran for this report given that three-quarters of cloud leaders say they are at least at the level of maturity where they're defaulting to cloud computing as a solution. Nearly half of the respondents say their organization is cloud native or fully cloud enabled.

Yet, in spite of this, their employees are stating they lack the knowledge to achieve these goals.

Without the proper tools, like hands-on labs and sandboxes, you put your critical business operations at risk and increase the likelihood of cloud security failures and data breaches. Human error continues to dominate as the leading cause of security failures, and data breaches can have a devastating effect for your business, including financial losses, reputational damage, and hidden costs of thousands to millions of dollars to remediate the breach.

A few things to note:



- **64% of learners surveyed noted they were brand new to cloud computing and looking for basic training.**
- Learning cloud is, on balance, more complex than the upskilling courses technologists are used to. As noted in the 2022 Tech Forecast report, these cloud-related courses are taking more time to complete. The median days to progress for cloud skills is 3 – 6 months longer compared to other technology skills content.
- This difference in understanding between leadership and employees is where organizations are running into problems.

Cloud experience levels

Level 5: Cloud enabled **22%**

Level 4: Cloud native **26%**

Level 3: Cloud default **18%**

Level 2: Ad hoc cloud **18%**

Level 1: No cloud **7%**

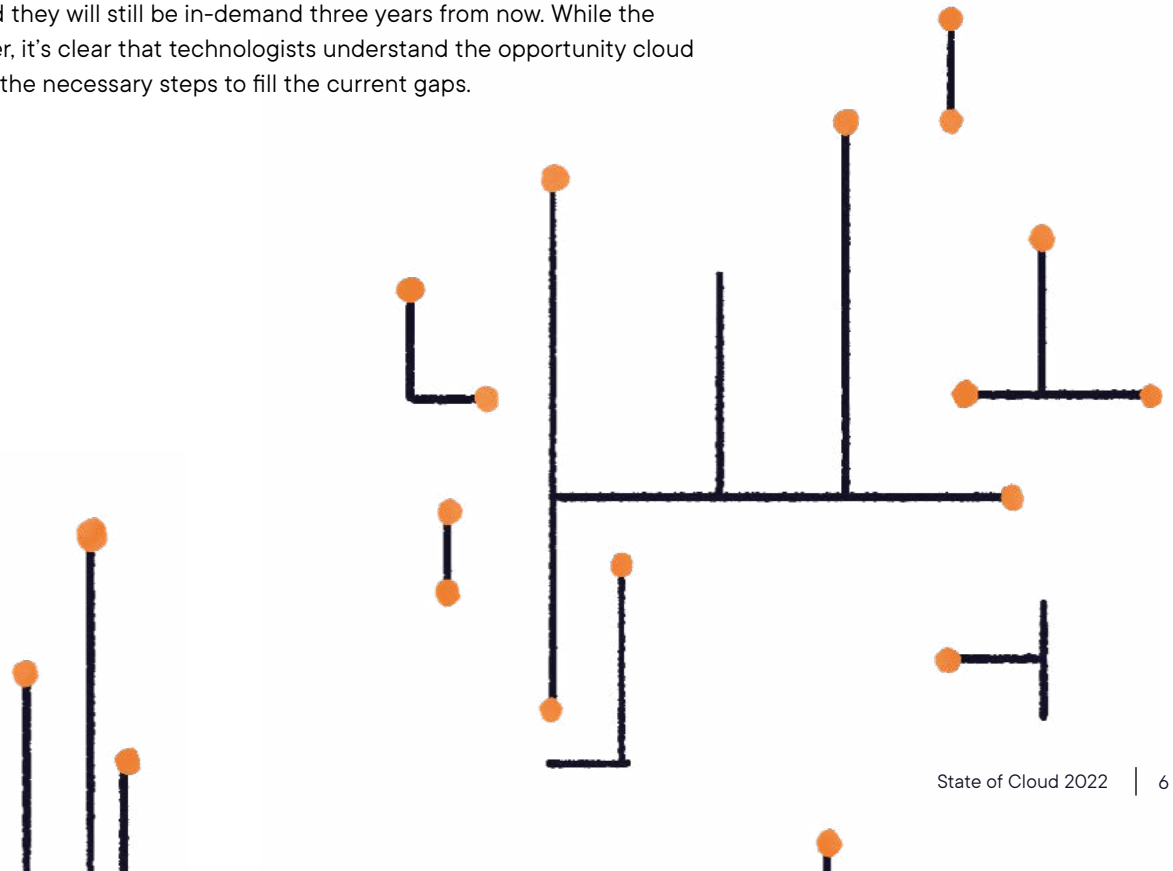
When leadership expectations are at levels beyond the capabilities of their employees, skills gaps form. These tend to directly result in poor engineering practices and misconfigured infrastructure and applications, which result in increased security risks. Aspects of the cloud, such as AI and machine learning, can be more complex beasts than any prior development concepts. Additionally, depending on the location of your organization, compliance for cloud computing is far more stringent when laws such as GDPR, HIPAA, and PCI DSS are taken into account.

Cloud talent doesn't form out of thin air. You can't expect a deluge of skilled cloud-capable technologists to flood your workforce. With the current landscape continuing to yield low returns regarding available developers, you have to create the talent from within before the ROI can rain down.

But the forecast isn't all dark skies. Technologists are actively working to close the gap between cloud skills reality and expectation.

The most popular course continues to be Intro to Cloud Computing, which was completed by 24,000 unique users in 2021.

This aligns with survey respondents, as 27% indicated that Cloud Basics certifications are the most in-demand right now, and 23% indicated they will still be in-demand three years from now. While the time to complete cloud courses is longer, it's clear that technologists understand the opportunity cloud computing skills provide and are taking the necessary steps to fill the current gaps.



THE TAKEAWAY

There's a clear disconnect between leadership cloud expectations and the reality of employee skill levels. This can cause friction, widen skills gaps, and increase security risks. The pace of change for cloud is intense and continuous—hiring to fill skills gaps isn't often an option for leadership.

Building that talent from within is the answer, but it takes time and direction. Technologists understand that opportunity lies within the cloud. This explains why introductory cloud computing courses remain so popular and necessary.



"As organizations, **we must become creators of talent**, not consumers."

—AARON SKONNARD, PLURALSIGHT CEO



II. The 2022 State of Cloud survey

We collected the data in this report by blind surveying 1,000 leaders and technologists. It was important to survey employees at every organizational level to determine large-scale expectations of the present and future of cloud computing as well as the confidence of those implementing these plans.

By determining what skills gaps exist between expectations and reality, your organization can instill tech workforce development solutions to bridge those gaps, reduce security risks, and successfully build your future in the cloud.

We've broken out the results into sections focused on leaders and then learners to make the report easily digestible and relatable for all audiences. You'll find takeaways at the end of each section that offer a TL;DR summary as well as actionable suggestions to resolve issues should they exist within your organization.

For example, the biggest discrepancy uncovered within the data was a massive disconnect between what tech leaders expect their teams to deliver and the skill levels of the tech learners expected to perform the necessary tasks. The purpose of this report is to drive organizational communication and synergy about cloud goals and how to reach them. In fact, leaders will likely find the most impactful takeaways in understanding what learners are saying and vice versa.

The report closes with actions designed to help your teams succeed with your cloud strategy, whether you're just beginning your cloud transformation or you've reached the stage of maturity where every new project is born within the cloud.

The sky's the limit to the success you can achieve if your org is willing to openly communicate about cloud computing.

POSITION

Individual contributor	280	26%
Manager	473	44%
Director	255	24%
VP	68	6%

REGION

United States	545	51%
India	194	18%
United Kingdom	164	15%
France	75	7%
Australia	66	6%
Germany	32	3%

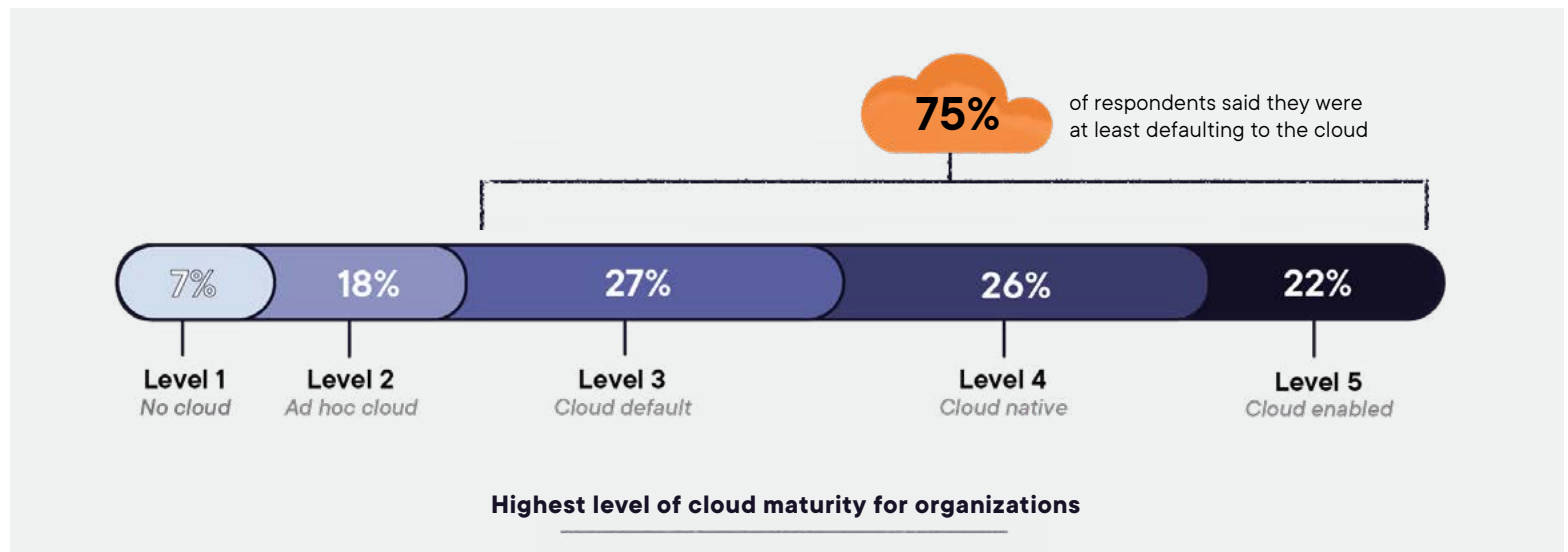
INDUSTRY

Technology	345	32%
Healthcare	259	24%
Financial services	196	18%
Industrials & manufacturing	153	14%
Government	123	11%

III. Leadership perspective: To infinity and beyond

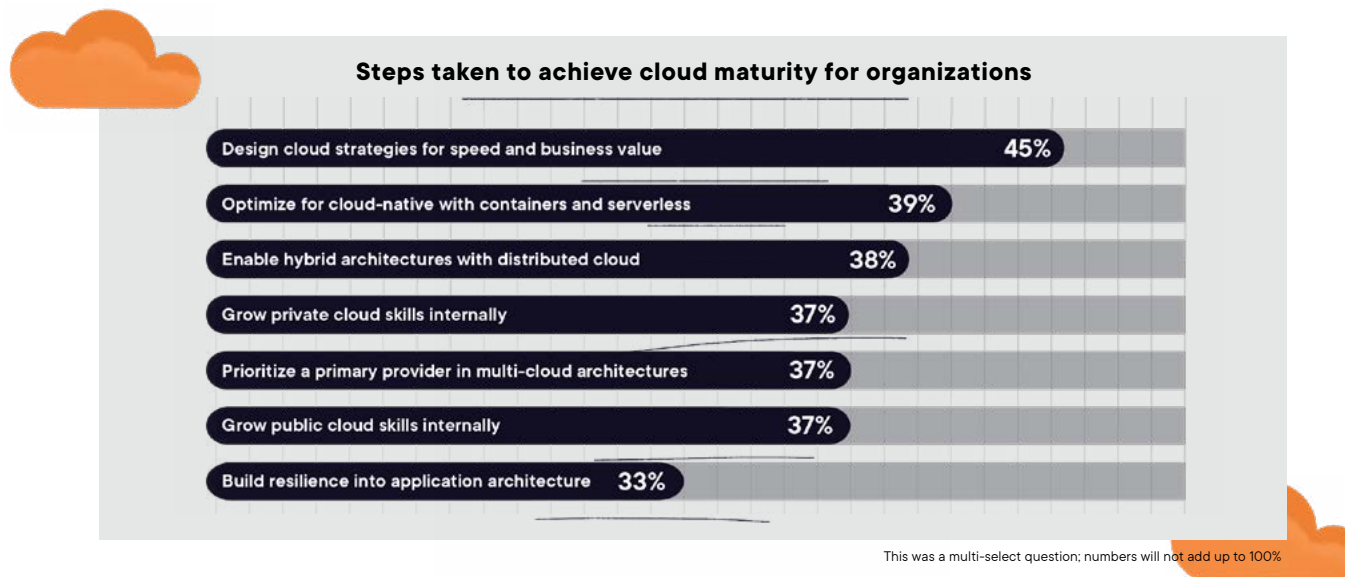
The data's clear: The expectations and plans of organizational leadership revolve around cloud computing. As mentioned earlier, when asked about their company level of cloud maturity, three-quarters of respondents said they were at least defaulting to the cloud. Those 75% of respondents indicated the level of their org's cloud maturity, defined as follows:

- **Level 3:** Have clear cloud governance and a documented approach for cloud operations that is always or almost always followed
- **Level 4:** Proactively deploy and manage cloud infrastructure that enables improvements in capabilities across the organization
- **Level 5:** Use strategic cloud governance and development to enable optimal business continuity and rapid scalability of security and other core business capabilities

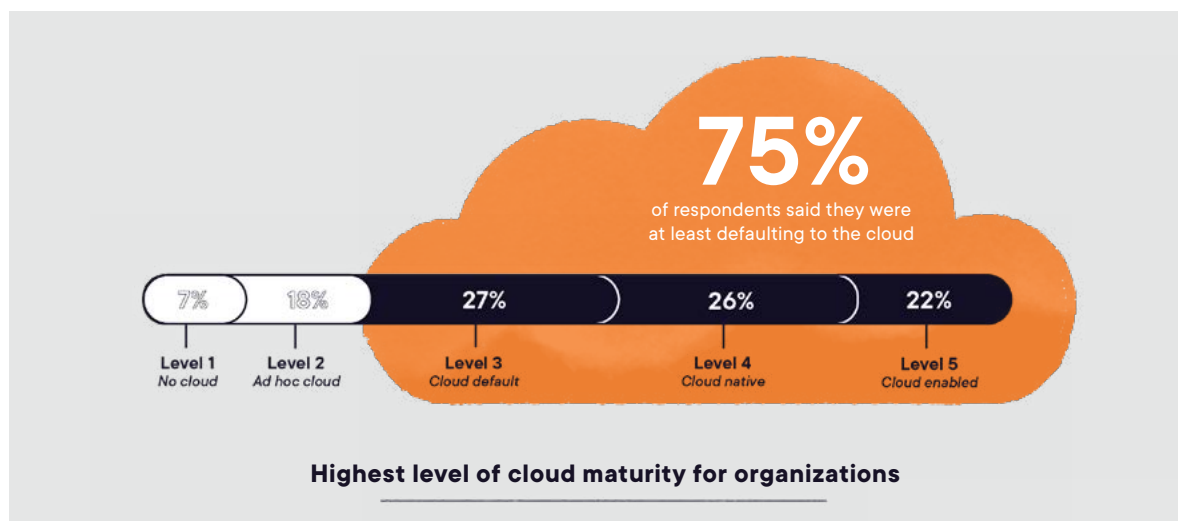


How can you reach your cloud transformation goals?

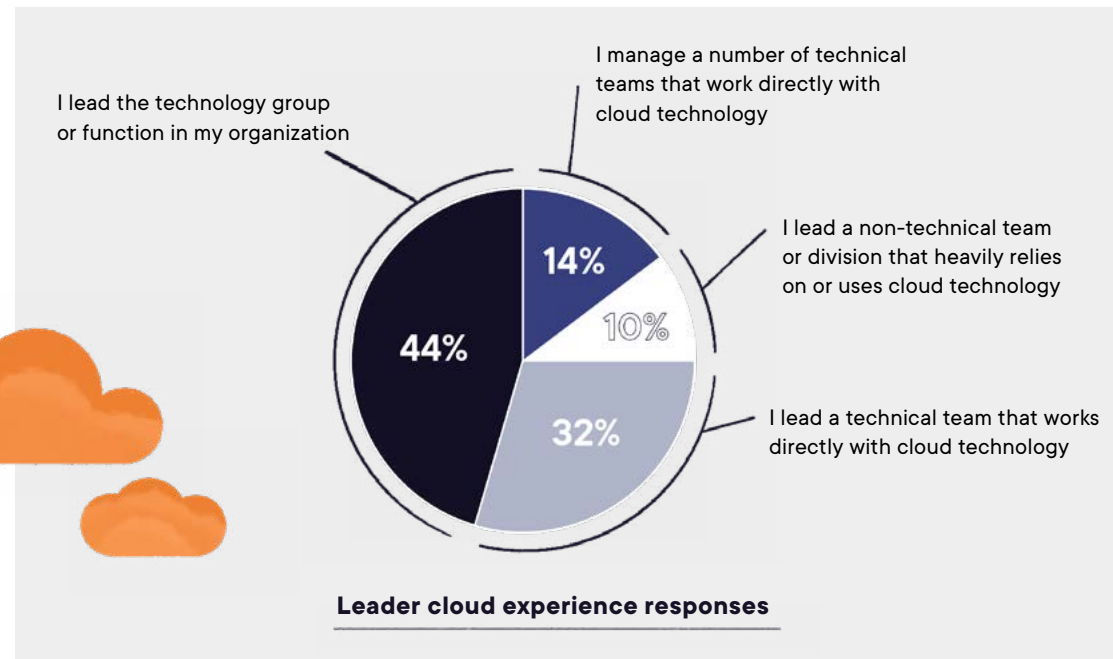
Organizations are achieving this level of maturity in multiple ways. When asked about the steps they're taking, the answers paint a positive picture. It's clear that leadership understands that the complexity of the cloud requires a multi-pronged plan. It involves designing and optimizing cloud strategies, growing cloud skills internally, and enabling hybrid architectures connected to distributed cloud technologies.



Although it seems executive leader teams have a plan and vision, a disconnect begins to form when it comes to execution.



While 32% of respondents state they lead a technical team that works directly with cloud technology, the largest percentage (44%) of responses came from those who lead the technology group/function within their organization.



Understanding that the largest sector of leader responses came from decision makers also helps explain the feedback we received on how their organizations adopt new technology. The overwhelming majority (62%) of respondents state that they try the latest technology as soon as it becomes available to them.

While the shiny, new thing is intriguing, this drive to be lightning-quick when it comes to cutting edge tech can turn your current employee skills gaps into chasms. We'll get into the learner aspect more in the next section, but as mentioned above, three-fifths of learner respondents note they're new to cloud and working on building basic fluency

Industry conferences **42%**
Industry analysts **41%**
Provider website **40%**
Social media **40%**
Online customer reviews/case studies **39%**
Recommendations from colleagues and/or networks **36%**
Weekly video digests **16%**
Blog **15%**

This was a multi-select question; numbers will not add up to 100%

Learner cloud experience responses



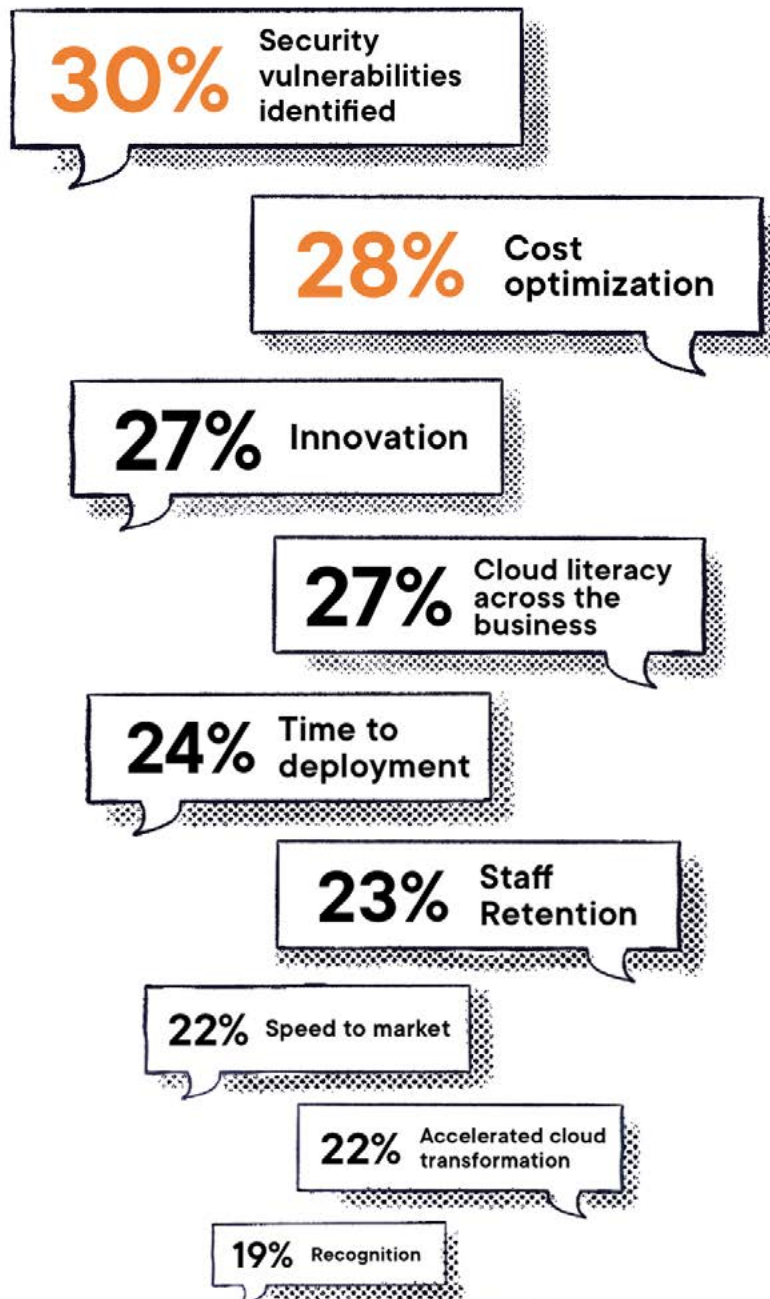
Perhaps even more importantly, only 8% of respondents note they have significant cloud-related experience.

When organizations are determined to focus on cloud-based builds moving forward but lack the knowledge base to do so, you create vulnerabilities and risk factors, the greatest of these being security. **Not only was security noted as the top challenge to achieving cloud maturity, it also came in as the number one skills gap for leaders and learners.**



40% of learners and leaders indicate *security* is the top skills gap AND the top challenge in preventing organizations from achieving cloud maturity

What cloud skill development success looks like to leaders



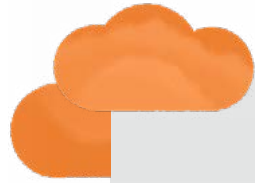
How do we define successful cloud implementation?

When asked what metrics leaders look to in determining successful implementation of cloud skill development programs, security still reigned supreme. Leaders noted numerous success metrics, including optimizing the cost of implementing cloud technologies and how quickly deployments can happen, but identifying security vulnerabilities is the chief concern for leaders. A perfect example is 2021's massive [Log4j vulnerability](#) that left countless organizations scrambling.

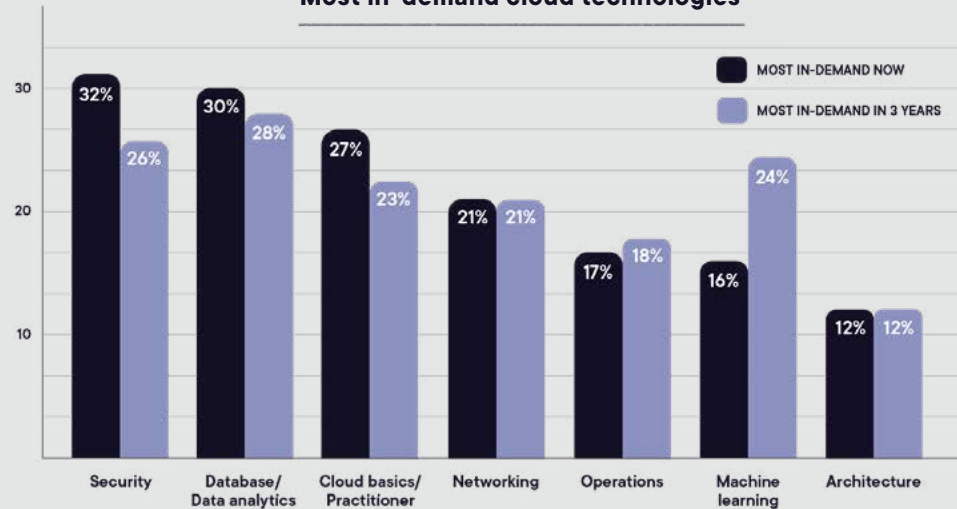
It's good news that organizations are eager to embrace new technology. While this excitement has the potential to create larger skills gaps, it also creates employee growth opportunities. The 2022 State of Upskilling saw the number one factor that drives employee retention is the opportunity to learn new skills. Investing in new technologies and creating a demand for cloud-centric certifications also entices your talent to learn new skills—and do so at your org.



The even better news is that organizations have thought a great deal about what those in-demand skills are. When asked about the most in-demand cloud certifications, leaders continued to note the importance of security but also highlighted a need for database analytics, networking, machine learning, and several other highly sought-after skills.



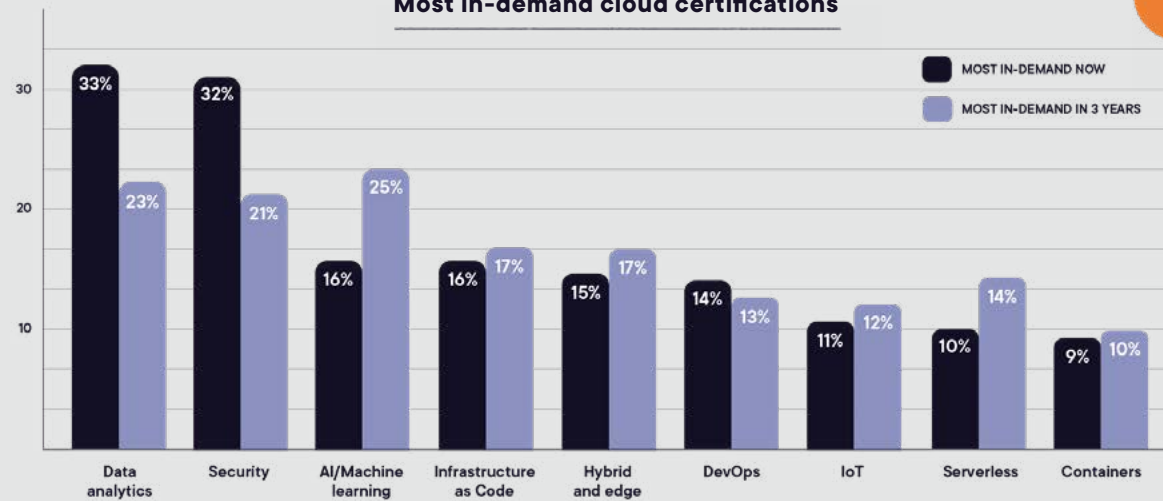
Most in-demand cloud technologies



This was a multi-select question; numbers will not add up to 100%



Most in-demand cloud certifications



This was a multi-select question; numbers will not add up to 100%



THE TAKEAWAY

For tech leaders, it's not just table stakes to live and breathe in the cloud. It's also tech leadership's expectation that teams will implement the latest and greatest technologies as soon as they become available. However, leaders admit that, like their employees, the number one skills gap is security.

An organization that's excited about new technologies should be an organization that's constantly creating new opportunities for their employees. This is a key tool in employee retention and offers a resolution in bridging the skills gaps preventing them from achieving their cloud goals: becoming creators of cloud talent through upskilling.

As tech leaders build out expectations that their cloud maturity levels reach such great heights, it's important to look at the other half of the story as well.



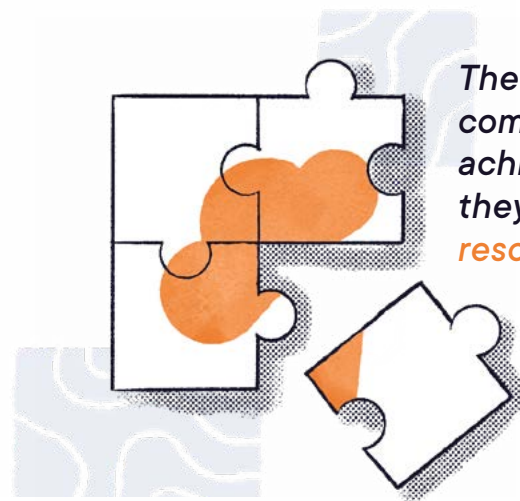
An organization that's excited about new technologies should be an organization that's **constantly creating new opportunities for their employees.**



IV. The cloud learner point of view: Confidence and time are key

How do cloud learners feel about their current knowledge base? We've noted several times that a significant number of respondents are seeking introductory courses in cloud computing. While it's not ideal that technologists, on balance, lack the skills to master what their leaders are seeking to accomplish, there's good news related to learner confidence. A customer survey conducted by A Cloud Guru (ACG) in early 2022 found that 97% of employees taking courses on upskilling platforms feel they improved their ability to do their work.

That ACG survey also revealed that 50% of technologists feel their improved cloud skills made the greatest impact in identifying issues and vulnerabilities with existing or proposed technical solutions faster. This highlights the connection between improved cloud skills and reduced security risks. The greater the levels of cloud competency your employees can achieve through upskilling, the faster they can identify security risks and resolve them.



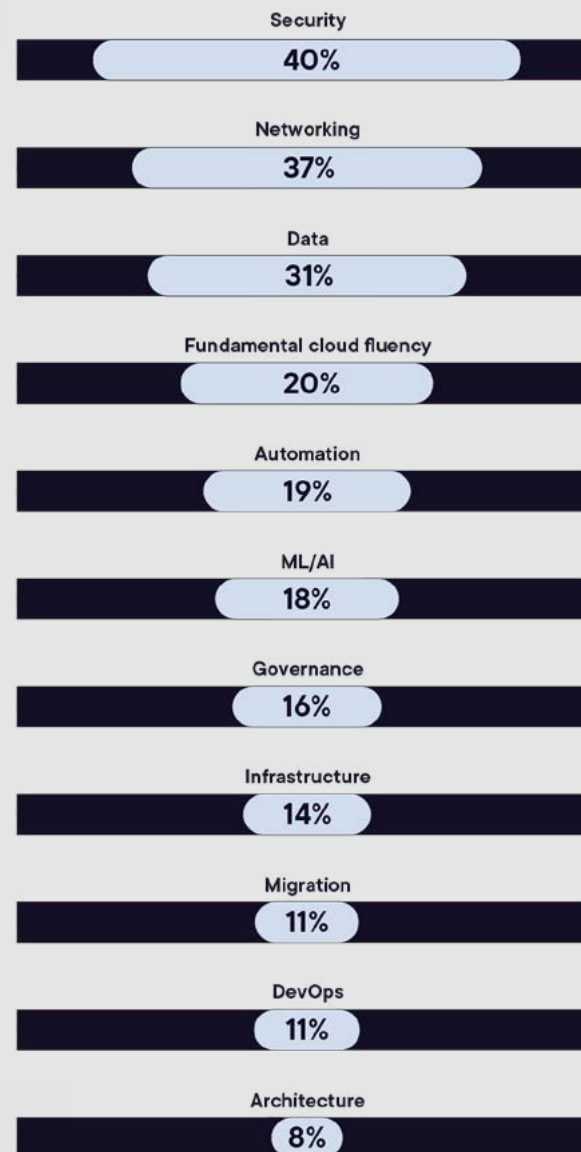
*The **greater** the levels of cloud competency your employees can achieve through upskilling, the **faster** they can identify security risks and **resolve** them.*

Most organizations have a five-year plan for their cloud strategy, but they don't have a five-year plan for their cloud talent. Without enough highly skilled cloud talent or a cloud-literate workforce, businesses experience insufficient expertise and resources needed to advance strategic technical projects. This insufficiency results in cost-overrun, rework, poor governance, immature procurement practices, low adoption, and slow or no innovation.

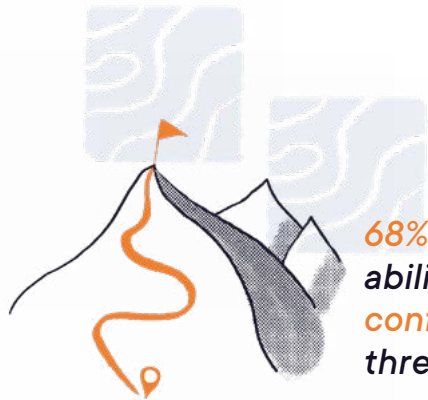
We've mentioned once or twice that the current need for cloud talent far extends the availability of said talent, so what do smart organizations do? **They create that talent from within. And they do so by listening to what their employees want in an upskilling program.**

Current learner skills gaps run the gamut from (say it with us, folks) security concerns down through infrastructure to migration issues and everything between. While these skills gaps are in line with those that leaders state they're currently facing, the good news is that learners are expressing confidence they have the ability to learn the skills needed to accomplish their jobs now and in the future.

Current learner skills gaps



This was a multi-select question; numbers will not add up to 100%



68% of learners are confident in their ability to do their job now, and 74% are confident in their ability to do their job three years from now.

Given that 64% of technologists are seeking basic cloud fluency, it's great news that they feel confident in their capabilities to become cloud fluent quickly. So, between the data within this report, the cloud course data from the Tech Forecast, and the 2022 State of Upskilling, it's clear that technologists are seeking out opportunities to learn new skills. All that's left to do is provide them the tools and time they need to fill those skills gaps.

How technologists learn and how they WANT to learn

Unsurprisingly, the way the technologists learn is as varied as the skills they're seeking to acquire. The survey provided a multiple-choice question about the resources available to them for learning, and online tech skill development platforms came in number one with nearly half the respondents saying they learned this way.

Also ranking high was in-person and virtual instructor-led training. This makes sense given that cloud learning doesn't exist in a vacuum. You need to understand several technologies before you're properly prepared to deploy. Instructor-led training, both virtual and in-person, enables learners to ask questions while instructors observe the ways participants work. This provides feedback and guidance opportunities that accelerate the learning process.



"As we are expanding our cloud operations, it is important to have appropriate training budgets, and to have experts embedded with teams, rather than asking the core cloud team to carry all of the weight as it does not scale. Every team should be advancing, enabling, and innovating."

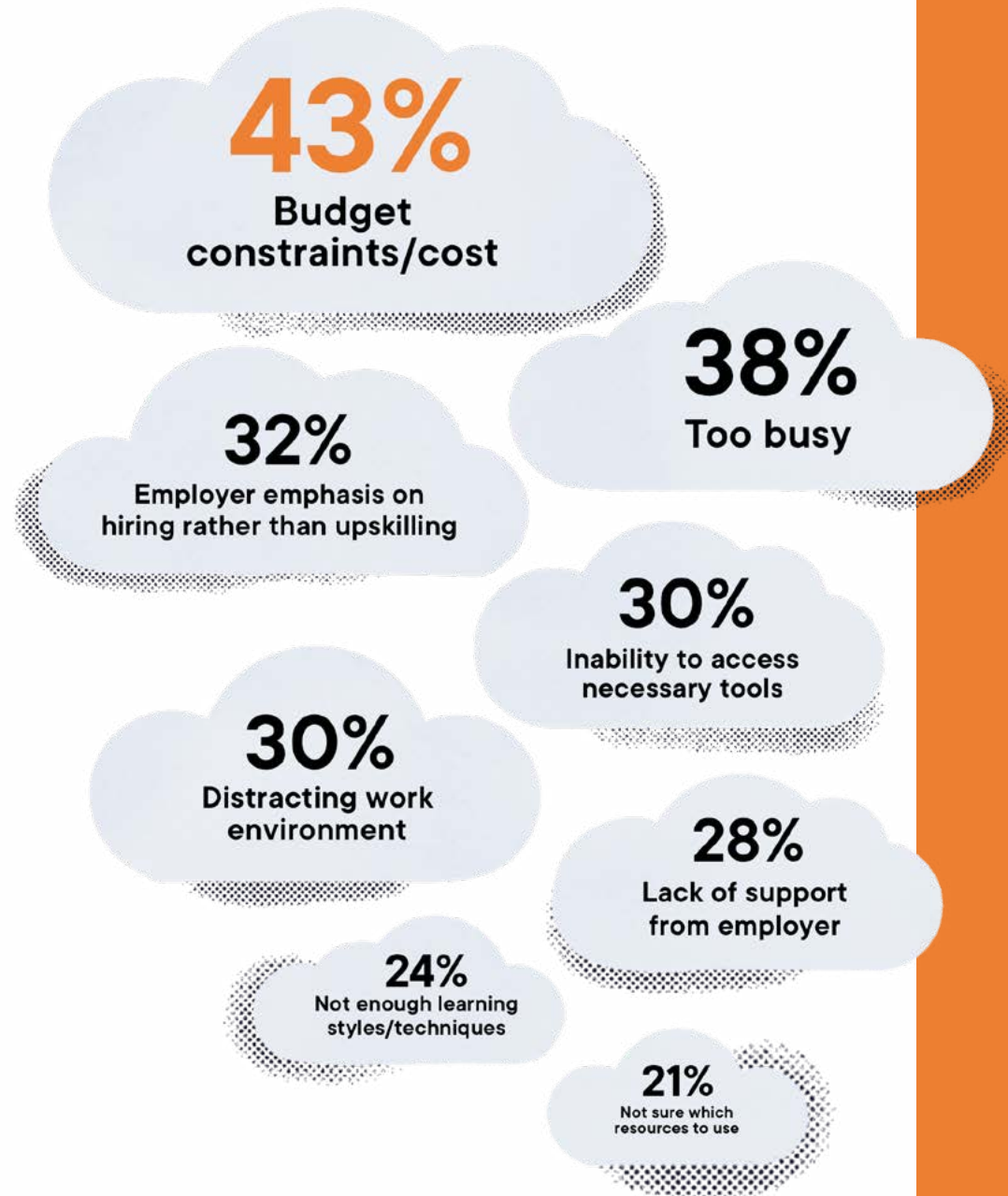
RICK AUSTIN, MANAGER PRODUCT DEVELOPMENT AT 3M HIS.



Barriers to cloud skill development

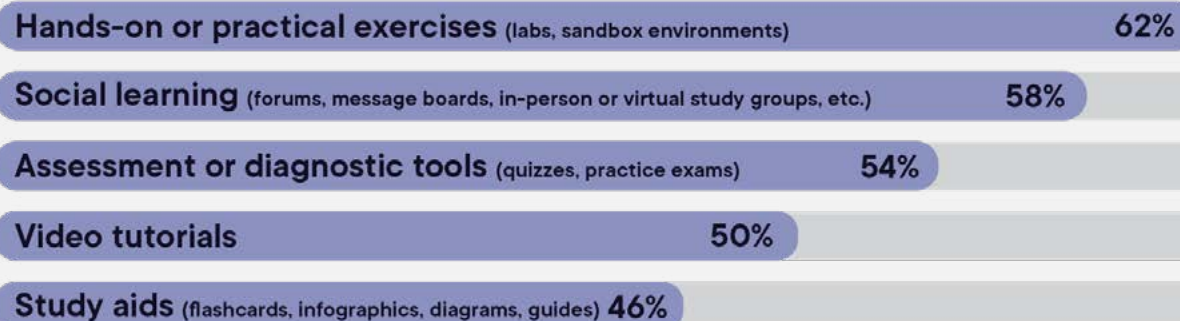
It's significant that dedicated work time for learning received 35% of the vote, because that directly correlates with common barriers to cloud skill development. While the top response in this multiple-choice question was budget restraints/cost, **the next five responses connect to lack of time or organizational support for their upskilling efforts.**

When asked about how frequently they would like to spend time learning, 71% of respondents noted that they prefer weekly or daily learning opportunities. We also asked technologists the formats they prefer to learn from, and 62% selected hands-on tools such as labs and sandbox environments.



This was a multi-select question; numbers will not add up to 100%

Best formats for developing cloud skills



This was a multi-select question; numbers will not add up to 100%

Building cloud castles in the sand(box)

Given the complexities of building applications within the cloud, it makes sense that the most vital learning tool connected to cloud upskilling would be hands-on sandbox environments. Sandboxes enable learners to practice in a real-world environment without the risk of breaking existing code bases, features, or ongoing development.

While cloud vendors provide sandbox environments, they offer a pay-as-you-go pricing model that presents a significant risk of running up. According to the A Cloud Guru Cloud 2021 Playground survey, ACG customers reported an average savings of \$6,664 per year/per user when using cloud sandboxes.

This risk is negated by upskilling services, such as Pluralsight Skills and ACG, that provide risk-free sandboxes using real accounts on AWS, Azure, and Google Cloud Platform. There's no worries about surprise bills for resources left running because the platform takes care of building, securing, and managing the sandboxes.

Two-thirds of respondents noted that their organization currently provides them with a sandbox training environment.

Developing cloud skills has been acknowledged as a top challenge for virtually every organization in this survey and beyond. Organizations need structured and holistic, open approaches toward building cloud fluency. Structured learning comes from tools such as ACG's Hands-on Labs, which places learners in a real-world environment and directs them toward a specific task. **ACG customer data notes that 84% of technologists prefer hands-on learning.** This experience can come from the aforementioned labs or sandbox environments.

Sandboxes enable learners to "free play," like a table of building blocks without any guides. They encourage creativity and free thinking. Sandboxes are a powerful tool that lets learners explore an open world, but the true value lies in fully customizable cloud sandboxes.

67% of
respondents
have access
to sandbox
training
environments

Custom cloud sandboxes bridge the skills gap between organizational plans and execution by providing a safe, real-world opportunity for learners to fail and test without the fear of breaking the actual production environment or putting business operations at risk.

The benefits to custom cloud sandboxes expand beyond the standard versions—they build upon existing spaces, giving learners access to non-customized AWS, Azure, and GCP sandbox environments. This enables teams to experiment with new cloud services and practice configuring them in an environment customized to their organization's cloud infrastructure, providing a hands-on skill development experience that helps mitigate technical errors and risk to your cloud environment, builds cloud expertise from within, and drives positive business outcomes.

Cloud technology evolves so quickly that the best way to keep up is to provide your employees with tools and opportunities that help them learn new concepts in real time within the environment they'll execute them in.



THE TAKEAWAY

While many technologists don't currently have the skills to achieve the cloud-driven goals of their organizations, they're confident they can get the job done, particularly when provided with the resources and opportunities to upskill. The best tools available are those that offer hands-on learning opportunities to your employees, and those tools are even more powerful when they are fully customized to your environment. Technologists need to be able to fail and break things in a controlled environment to learn. And they want to learn in hands-on labs and custom sandbox environments. Upskilling and learning by doing will ensure your teams are ready to work in a live production environment without putting critical business operations at risk.

Investing in your employees internally and giving them the tools and time to upskill is the ideal solution for mitigating security and compliance concerns, closing cloud skills gaps, and optimizing cloud costs.

How to shrink skills gaps and reduce lost internal knowledge

Employees need to be aligned with company strategy while they begin to upskill to build within your cloud structure. Institutional knowledge is hard to come by and critical to maintain, which means it's essential that you don't allow critical internal knowledge to leave with an employee if they leave your company.

Providing upskilling tools and opportunities is a worthwhile investment, but an investment nonetheless, so take steps to assure it properly benefits your long-term goals.

You can mitigate this risk in a few ways:

- Schedule cloud upskilling times as if they were ceremonies and build in a retrospective meeting for knowledge sharing
- Set up instructor-led training courses for entire teams where specific skills are needed
- Reduce knowledge silos through mentorship, documentation, and [cross-team collaboration](#)
- Incentivize employees to upskill through transparent conversations about organizational cloud plans
- Set skip-level meetings for junior-level developers to learn from senior devs



To be able to deliver, BT needed to ensure its teams' skills were up-to-date in ever-evolving technologies like AWS, Google Cloud, and the latest software development practices. That meant supporting thousands of developers through 24/7 learning opportunities—while adopting Agile development methodologies and increasing Agile know-how across the organization.

[Watch the BT story here.](#)

V. Success: This is what it looks like

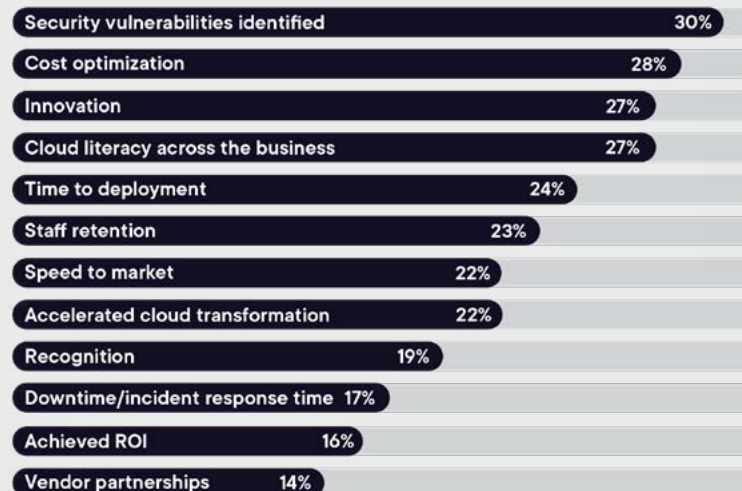
When it comes to implementing cloud skill development programs, success looks different in the leader vs. learner space. For leaders, the top success metric is identifying security vulnerabilities. Leaders noted several other important factors, including the cost of cloud optimization, the ability to innovate, and building cloud literacy across the business. In short, success has many faces for leadership.



“We measure success in terms of true engineering impact. Seeing motivated learners coming out and graduating from these programs and being able to actively apply their learnings to the migration or re-architecting of their applications to be cloud-ready.”

JASMIN, DEUTSCHE BANK

Leader metrics for implementing cloud skill development programs



Learner metrics for implementing cloud skill development programs



This was a multi-select question; numbers will not add up to 100%

Learners want cloud upskilling investment for myriad reasons connected to personal and professional growth. The majority of learners' responses connected directly to advancing their careers, taking on new roles within the organization, or promoting personal development.

This also directly correlates with the reasons why technologists consider leaving their current jobs. While a lack of work-life balance was the top response, the next two responses directly connect to the desire to learn and grow. Technologists want to upskill. They want to take on new responsibilities and work with new technologies.

At the surface level, these two views of success may seem opposed, but they're directly connected. Leaders want to more quickly identify and resolve security vulnerabilities, foster innovation, and drive toward a cloud-first approach. Learners want to learn the skills that will enable them to fill the roles needed to achieve these goals.

The more upskilling opportunities learners can access through their organizations, the more likely they are to remain fulfilled with their work and growth. The global talent shortage in the cloud space is real and substantial, so you must become a creator of talent. The great news: ACG's customer survey notes that **employees are 94% more likely to stay with a company long-term when the organization invests in their skill development.**

When you invest in tech skill development, your employees become more capable of hitting your organizational goals and less likely to seek out new opportunities elsewhere. Those technologists are more likely to feel satisfied with their growth opportunities internally, which leads to a healthier work-life balance, organizational culture, and greater overall productivity. Investing in the upskilling of your employees is a holistic solution to reaching your cloud goals.



VI. Take the next step to cloud transformation

Thousands of organizations trust Pluralsight to help them upskill and reskill talent at scale. We're the only partner who can provide:

- Focused solutions for driving strategic cloud transformations across your org
- 3,000+ Hands-on Labs with specialized experiences for cloud, software development, security, data, and IT Ops
- Cloud sandboxes where learners can test their skills in real cloud environments—risk free
- Assessments, learning paths, and certification prep to support the journey from cloud novice to cloud guru
- Insights on skills gaps and where proficiency is improving for your team members
- Individual on-demand learning and tailored virtual instructor-led training programs
- Software delivery analytics to help you gauge time to full productivity after a learning program

Develop a workforce of cloud-fluent experts to execute on your cloud initiatives. Only with Pluralsight.



FIND YOUR CLOUD SOLUTION



ABOUT PLURALSIGHT

Pluralsight helps organizations around the globe advance their technology workforce. Because the hardest part of building a business isn't building software and technology. It's building up the people who grow your business. That's why everyone from CIOs to developers trust Pluralsight—the only partner who helps leaders build better teams and better products, all at the same time.

Our software and solutions are purpose-built to address your top challenges and outcomes:

- Onboard new engineers faster
- Build products faster and improve developer experience
- Develop internal cloud talent and enable cloud transformation
- Improve retention and cut hiring costs
- Improve cycle times and reduce burnout for remote teams
- Develop teams that deliver on key tech initiatives
- Increase delivery speed and overcome Agile roadblocks
- Hire job-ready, diverse talent
- Build fluency and collaboration—organization-wide

Our cloud transformation solutions help you create the cloud talent you need, when you need it, to deliver on your biggest, boldest vision. Pluralsight Skills and A Cloud Guru deliver expert-authored courses in the latest cloud technologies paired with unlimited access to Hands-on Labs, sandboxes, and certification prep. Upskilling your teams with Skills and ACG equips your teams to execute on strategic cloud investments that ultimately drive innovation, automation, and efficiency.

