

**Discovery
Report**

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Cloud Financial Management Benefits Go Beyond Cost Savings

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451 Research

S&P Global
Market Intelligence

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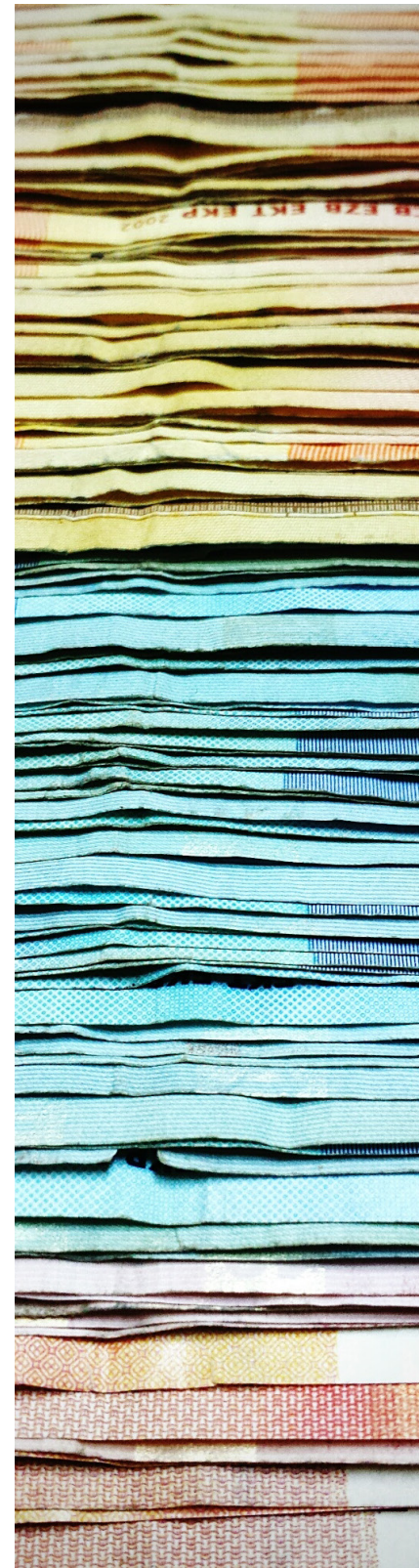
Introduction

As public cloud costs grow, companies naturally look for ways to monitor and manage cloud expenses. Inflation and rising interest rates add urgency to the effort, while a survey of organizations spending \$100,000 or more annually on public cloud shows that 80% exceed their cloud budgets in most months. While cost remains a concern, cloud spending management is about taking charge of consumption to maximize value of an organization's investment: An overwhelming majority (95%) of survey respondents agree that using cloud services reduces the total cost of operations (TCO) for IT infrastructure when compared with on-premises equivalents.

Still, within the public cloud domain, there are several fundamental ways for organizations to get more for their investment. First is the most obvious method and also one of the most effective: reducing waste and increasing utilization of resources. Organizations can achieve this through engineering (by building applications to scale resources automatically in response to client-side demand) or by using cloud provider platforms with this capability built in (such as managed databases or intelligent storage tiers). A second method, ideal for more predictable workloads, is to purchase resources in advance at a steep discount. A third technique is to use arbitrage, either by tapping into cloud providers' excess capacity via spot instances or using machine-learning-based tools to configure workloads for optimal cost, performance and resilience.

But one size does not fit all. Controlling public cloud spending across an application estate — ensuring that overall value keeps growing — means continually monitoring usage *in a way that's meaningful to the business* and driving cost awareness into the nodes of the organization where resources are being provisioned. At the same time, in an era of rising energy prices, organizations seeking to reduce their carbon footprint find that IT teams play a critical role in sustainability initiatives. Reducing waste has both financial and environmental benefits.

Public cloud has had a profound effect on IT in the past 20 years, and this is bound to continue. As adoption grows, organizations are naturally spending more, but cloud financial management can ensure that the benefits gained continue to outpace costs.



Key Findings

- A survey of companies spending \$100,000 or more annually on public cloud shows that 80% exceed their cloud budgets in most months. Yet 95% of respondents agree that using cloud services reduces the TCO for IT infrastructure when compared with on-premises equivalents.
- Unit costs for public cloud infrastructure have stayed low even as macroeconomic inflation has reached historic highs. Our research finds that cloud buyers are spending the money they save by moving to cloud on new services to improve productivity and derive new revenue, not necessarily to reduce costs.
- Businesses implementing cloud financial management practices report that their efforts are most likely to result in greater cloud adoption, higher revenue and improved profitability.
- Based on the results of our survey, best practices for cloud cost control include: using the full range of available services (infrastructure, platform and software); taking advantage of the full range of pricing models available (on-demand, reserved instances, savings plans and spot instances); allocating costs in a way that is meaningful in business terms, whether via account management, resource tagging or chargeback/showback; and ensuring that financial management is in the hands of teams with both ownership and accountability for cloud spending.
- IT teams are the primary drivers of cloud financial discipline for more than half of organizations, but this responsibility can change depending on the degree of spending, with the duty shifting to platform and finance teams at higher levels.
- IT teams are also very involved in setting sustainability goals: 86% of the organizations in our sample have a formal sustainability program in place; of those, 71% report that IT is very involved in setting and meeting sustainability goals.

Benefits of Cloud Financial Management

Broadly speaking, cloud financial management (also known as financial operations or FinOps) is a set of principles and practices for infusing cost awareness and accountability into the provisioning, deployment and monitoring of cloud resources. FinOps can include account-level discipline, chargeback and showback, resource and account tagging, forecasting and budgeting, cost monitoring and alerts, and the use of commitment discounts or spot instances. Far from the credit-card-swiping days of “shadow IT,” where individuals would spin up cloud resources and recoup the costs on expense reports, organization-wide management becomes critical as cloud usage goes mainstream and bills continue to rise.

Adopting these practices can save money, but cloud users are likely to take those savings and invest them in more cloud services: 451 Research’s Voice of the Enterprise (VoTE): Cloud, Hosting & Managed Services (CHMS), Budgets & Outlook 2022 survey found that 72% of current public cloud users plan to increase their spending in the coming year — more than any other category (SaaS was second with 64% planning to spend more).

In other words, those who say that spending more on cloud is necessarily a bad thing are missing the point. Unit costs for public cloud infrastructure have stayed low even as macroeconomic inflation has reached historic highs: 451 Research’s Cloud Price Index shows that benchmark pricing for public cloud compute has barely budged in the past two years. And cost savings from switching to cloud or optimizing cloud usage can be spent on new services to improve productivity and derive new revenue. This is an example of the Jevons paradox, which occurs when an increase in the accessibility and efficiency of a technology (in this case, public cloud) leads to an increase in demand, and thus in total costs.

The vast majority (96%) of respondents to our survey forecast or budget cloud spending — not surprising given that they spend an average of over \$700,000 on cloud annually. Yet most organizations (over 80%) typically exceed their expected spending, and not by a trivial amount: half run over budget by more than 25% (see Figure 1).

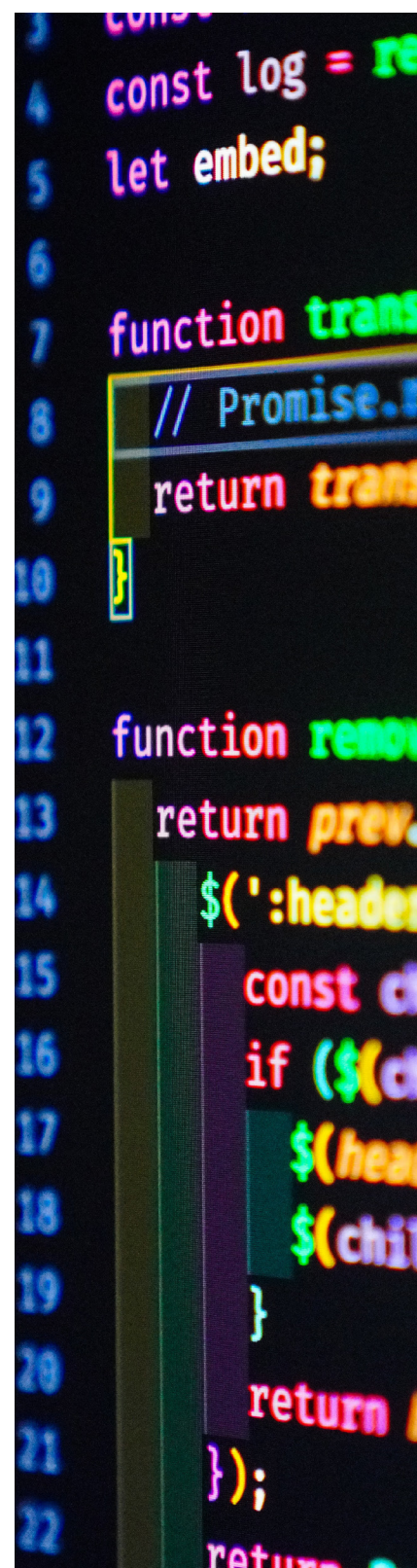


Figure 1: Most organizations are exceeding their cloud budgets

- Our budget is not exceeded, or exceeded by a trivial amount
- We spend up to 25% more than budgeted
- 26%-50% more than budgeted
- 51%-100% more than budgeted
- 101%-200% more than budgeted

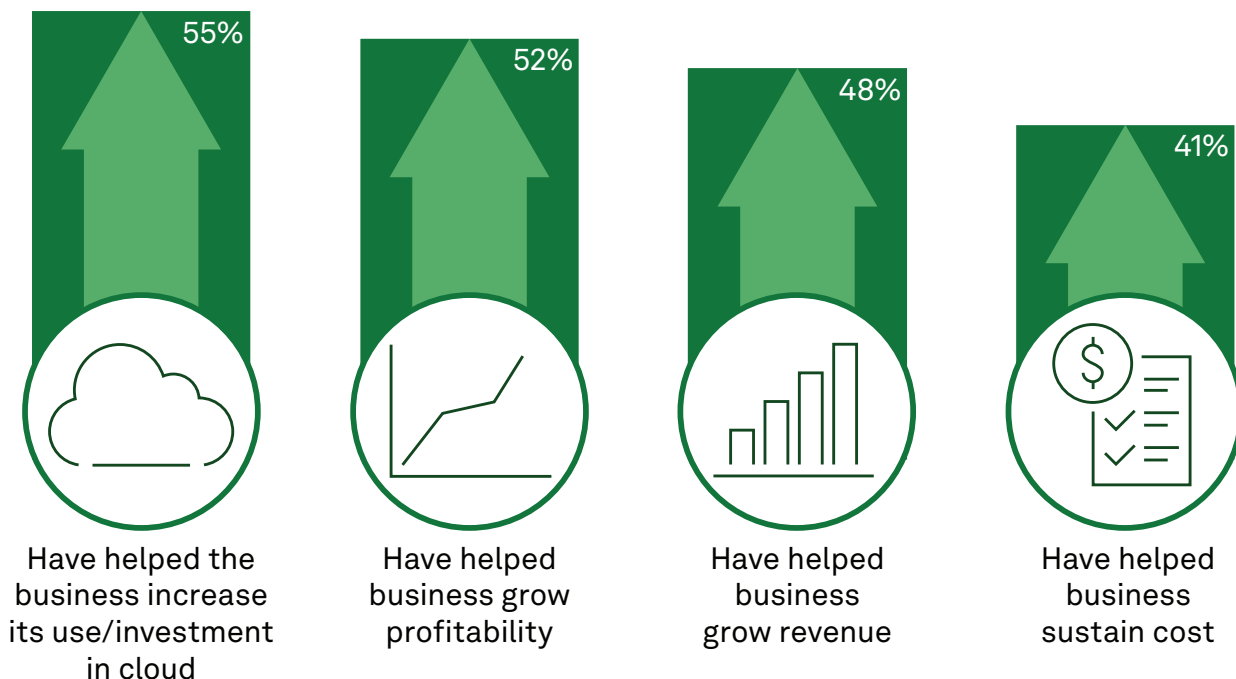


Q. On average, by how much do you typically exceed your budget on cloud resources?
Base: All respondents (n=1,000).
Source: 451 Research custom survey, 2022.

In an atmosphere of macroeconomic inflation, buyers are turning to public cloud for the reasons that have made it a game-changer in IT portfolios over the past five years: the ability to use operational expenses for infrastructure, to experiment with innovative services that can off-load operational toil to cloud providers, to accelerate development in response to end users' expectations for more personalized experiences, and to better match resources to actual demand as it ebbs and flows (versus making long-term capital outlays to accommodate peak demand and enduring average utilization rates as low as 20% or 30%).

With annual cloud expenses reaching into the millions for many organizations, cloud financial management becomes essential for tying spending to outcomes. Businesses implementing cloud financial management practices report that their efforts are most likely to result in greater cloud usage, higher revenue and improved profitability (see Figure 2).

Figure 2: Top impacts of implementing cloud financial management practices



Q. Thinking of your overall experience of implementing cloud financial management practices, what impact have they had on the following?
Base: All respondents (n=1,000).
Source: 451 Research custom survey, 2022.

People speak of cloud adoption as a journey, and survey results show that longer experience with cloud leads to better outcomes. Longer-term cloud users are more likely to implement best practices for cloud financial management, supporting the idea that this is a continuous improvement activity, and they are also more likely to achieve reduced costs, with over 60% of those with more than four years' cloud usage reporting unit cost savings of more than 60%. Customers don't need to make wholesale changes to their IT environments: with the majority of IT transformation still ahead (451 Research's *VotE: CHMS, Cloud Pricing 2022* survey found that more than three-quarters of IT decision-makers expect their organizations' IT environments to undergo moderate to major transformation over the next three to five years), cloud provider offerings continually expanding and cloud skills at a premium, incremental improvement can be the prudent option.

“When it comes to cost management, it surprised me in that first 18 months [our cloud provider was] constantly asking us, ‘Hey, let’s meet and talk about cost savings opportunities. Let’s get you into these reserved instances... or we’ll give you a report of things that look like they’re not being used...’ And so they were actually, without us even trying to do it, they were teaching us the art of cost optimization.”

IT/engineering manager/staff

100,000+ employees, \$10B+ revenue, Food, beverage & agriculture

Best Practices for Cloud Cost Control

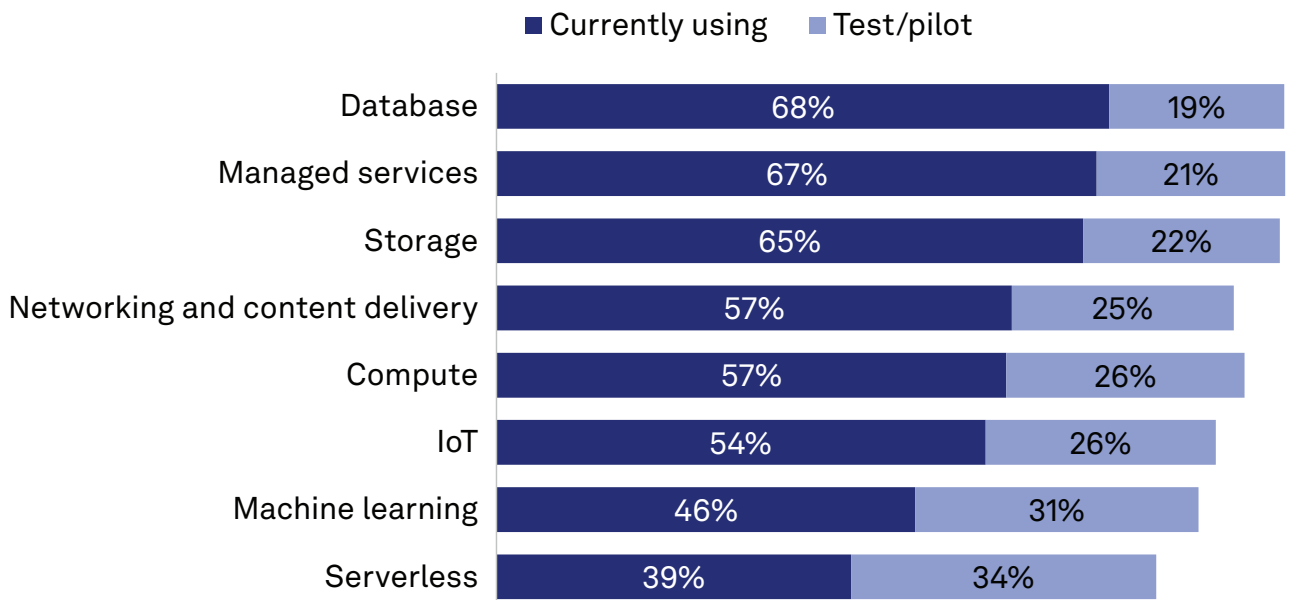
Results from a survey of 1,000 IT decision-makers at organizations spending at least \$100,000 annually on public cloud reveal best practices for achieving the financial and operational benefits cited above.

Take Advantage of the Full Range of Cloud Services: Infrastructure, Platform and Software

As deployments grow and cloud providers launch more sophisticated services such as database and machine learning platforms, companies appear to be shifting away from self-managing these functions (see Figure 3).



Figure 3: Database and other managed services are eclipsing use of compute infrastructure



Q: How would you characterize your use of the following AWS technologies?
Base: All respondents (n=1,000).
Source: 451 Research custom survey, 2022.

In the early stages of cloud adoption, users are happy to put some data in a storage bucket and spin up virtual machines for test and development purposes. Yet as deployment matures and spending increases, services that can effectively off-load operational toil from in-house IT teams take hold. Respondents using databases in particular (and managed services more generally) are more likely to cite improved labor efficiency, lower unit costs and lower total costs as benefits of financial management practices.

“The serverless database options... are compelling from a cost standpoint. You go out and pay for what you use and grow as you need. So I haven’t heard any complaints about the database cost.”

IT/engineering manager/staff

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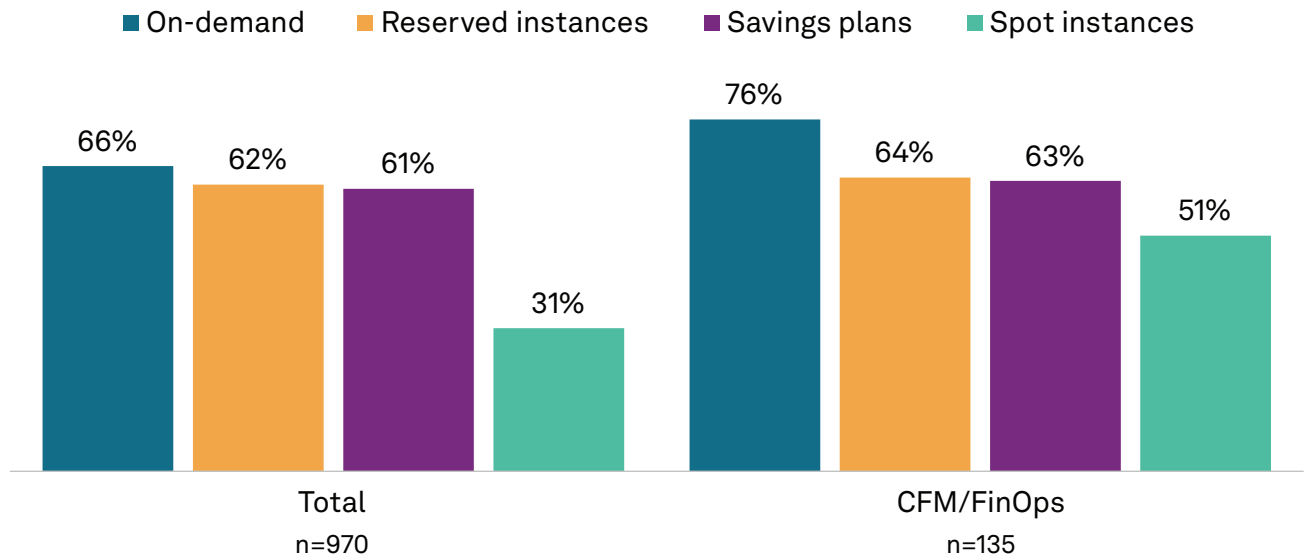
Take Advantage of the Full Range of Pricing Models

Our survey results point to the benefits of using commitment discount programs and spot pricing for cost control. Respondents with higher cost savings are up to 40% more likely to be using spot and more likely to have adopted savings plans, which let customers purchase resources at a deep discount (60% or more) in exchange for making a one- or three-year commitment. While lower cost is an appealing feature of this model, so is convenience: Having a pre-allotted cache of compute resources at the ready gives developers the freedom to spin up processing power without having to go through a procurement process.

True to cloud’s roots, on-demand purchasing remains the top pricing model (66%), followed closely by reserved instances (which offer the greatest savings but are tied to particular machine types and locations) and savings plans (see Figure 4, left side). The use of multiple pricing plans implies a strategic mixing and matching of purchasing types to workloads. So, for example, a baseline allocation of compute power can be set up for steady-state applications with known capacity demands, spot instances can be applied to batch jobs and other “bursty” but interruption-tolerant workloads, and on-demand machines can be spun up to accommodate ad hoc and experimental usage.

Survey respondents at organizations with dedicated cloud cost management teams are more likely to be applying the full range of buying options (see Figure 4, right side). They are more inclined to use on-demand and spot pricing than other cost management stakeholders such as IT, development, platform and finance teams. On-demand and spot instances represent the highest and lowest pricing extremes in public cloud, respectively, but overprovisioning via the more moderately priced reserved instances and savings plans results in purchased resources going unused (i.e., waste).

Figure 4: Cloud financial management teams are more likely to use the full range of available purchasing models



Q. Which of the following pricing models does your organization use to purchase cloud resources today?
 Q. Which role in your organization is primarily responsible for implementing cloud financial management (CFM) practices?
 Base: All respondents.
 Source: 451 Research custom survey, 2022.

Allocate Costs in a Way That Is Meaningful in Business Terms, Whether Via Account Management, Resource Tagging or Chargeback/Showback

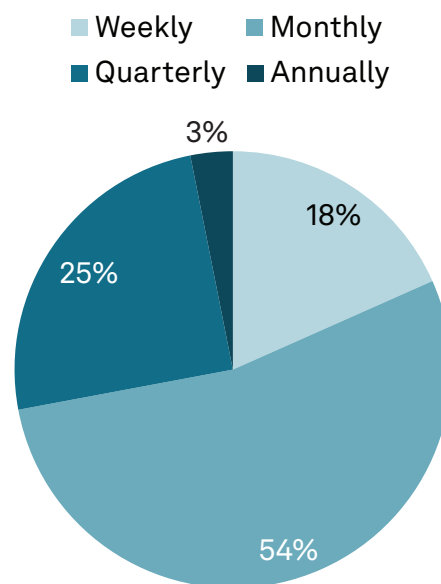
“[For public cloud pricing] we use chargeback models. So we set up accounts in the clouds and then they get charged back... and we take percentages out for like management and for the different groups that have to be involved... We’re constantly evaluating how can you reduce your cost in public cloud; for example, can we move you from Windows to Linux, or can we put in long-term contracts for one year or even three years of consumption, you get lower rates.”

IT/engineering manager/staff
 100-249 employees, \$25M-\$49.99M revenue, Government

Customers with higher reported cost savings indicate that managing accounts and tags is very important to public cloud spending control — even more so than chargeback or showback to specific departments. Each option has its place depending on an organization’s reporting lines and stage of cloud maturity. In many businesses, departments have grown up around IT functions that are tied to on-premises implementations. As workloads move to cloud, companies are finding that “shifting left” — building new cloud-native applications in a way that applies policies and governance throughout the development cycle rather than after the fact — is a more efficient, repeatable way to ensure compliance with respect to security, cost, data sovereignty and other factors.

Whichever types of allocation are in use, spending must be tracked on a regular basis. Our research shows that monthly forecasting and spend tracking is the most popular option (see Figure 5), which aligns with cloud providers’ billing and commitment pricing schemes (long-term contracts are typically compared with shorter-term models by amortizing them on a monthly basis). Survey respondents report that monthly versus quarterly forecasting results in considerably lower unit costs over time.

Figure 5: Monthly forecasting is most common



Q. For what time period do you forecast your cloud spending?
 Base: All respondents (n=959).
 Source: 451 Research custom survey, 2022.

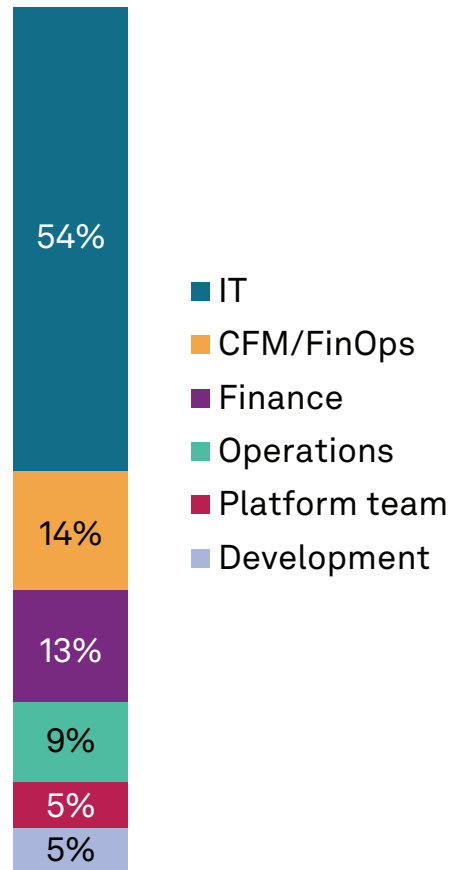
“[Our ability to manage and control cloud costs] is pretty good because we reexamine it every month. We produce these cost optimizations. We produce capacity reports and utilization reports. So I think you control it by providing the data, cost, performance, capacity availability. And if you provide the data, then make it digestible by the managers and the finance people, then it drives the behavior.”

IT/engineering manager/staff
 100-249 employees, \$25M-\$49.99M revenue,
 Government

Ensure That Cloud Financial Management Is in the Hands of Teams With Both Ownership and Accountability

Our survey shows that ownership of the cloud financial management function rests primarily with IT teams (see Figure 6); this finding is consistent across spending levels. In most organizations, IT teams are responsible for both budgetary discipline and cloud resource positioning. As cloud spending increases, however, other groups may assume a greater or lesser role. For organizations spending less than \$750,000 annually on public cloud, development and operations teams are more likely to have primary responsibility for spending management; once cloud spending crosses that threshold, this duty is apt to shift to platform and finance teams.

Figure 6: Cloud financial management is primarily an IT department responsibility



Q. Which role in your organization is primarily responsible for implementing cloud financial management (CFM) practices?
Base: All respondents (n=1,000).
Source: 451 Research custom survey, 2022.

Cost Management and Sustainability Go Hand in Hand

With cloud computing and other IT industries leading the way in new technologies and innovation, the expectation is that they will also be pioneers in environmentalism and sustainable growth. As top power/energy consumers, cloud technology providers (particularly the hyperscalers) have made strong commitments to become 100% powered by renewable energy and advance toward net-zero carbon footprints, and they have implemented carbon footprint tools to help customers track the impact of their own cloud usage.

The importance of these commitments to buyers of cloud services is borne out by our survey results, showing that 86% of the organizations in our sample (i.e., those who spend \$100,000 or more annually on public cloud) have a formal sustainability program in place. And IT teams are top contributors to the effort: 71% of those with sustainability goals cite IT as being very involved in setting and meeting those goals (see Figure 7).

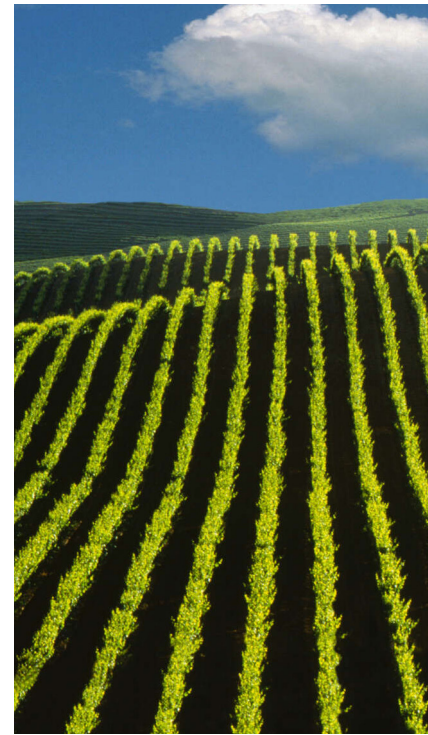
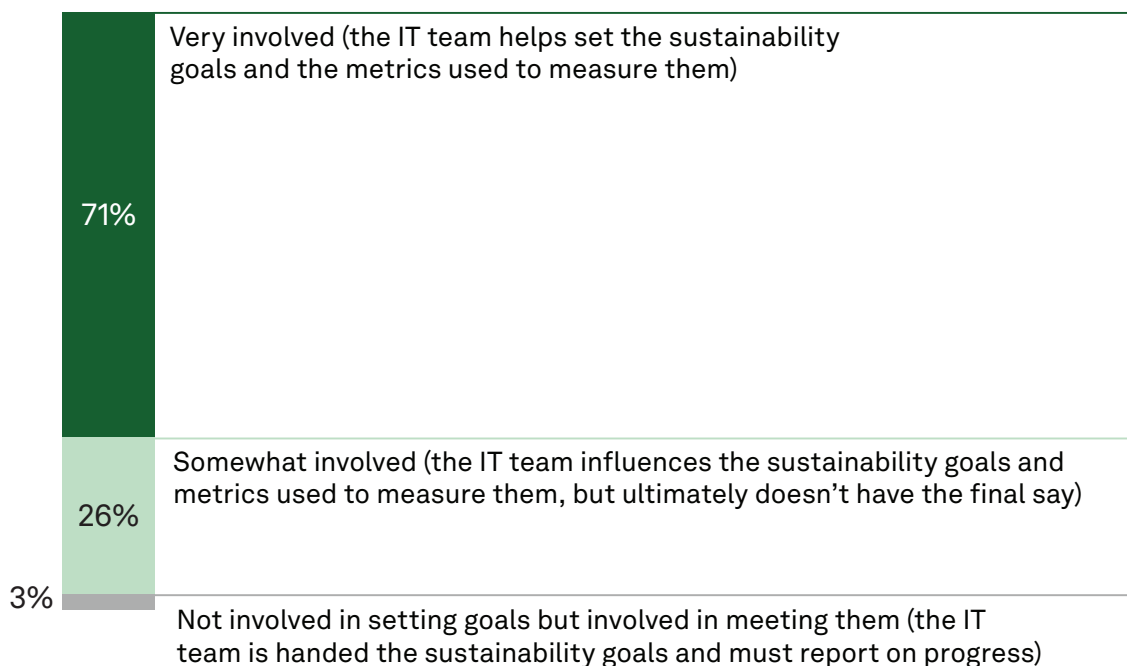


Figure 7: IT teams are very involved in setting and meeting sustainability goals



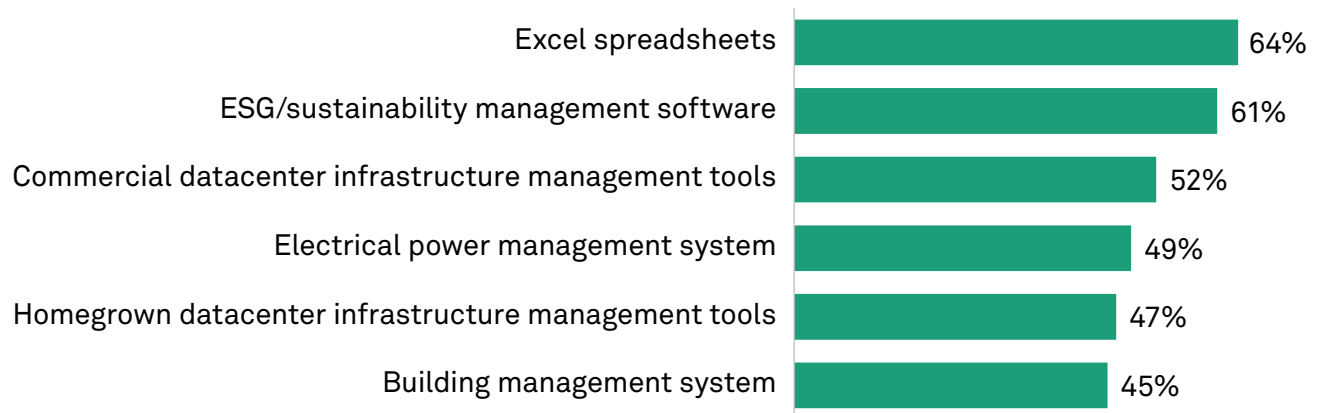
Q. How involved is the IT team in setting/meeting your organization's sustainability goals?
Base: Organizations with a sustainability program in place (n=861)
Source: 451 Research custom survey, 2022.

The Greenhouse Gas Protocol is an industry-standard way to report carbon emissions. Scope 1 includes emissions directly from operations owned or controlled by the reporting company, Scope 2 encompasses emissions from purchased or acquired energy, and Scope 3 identifies indirect emissions in the upstream and downstream supply chains of the reporting company. When enterprises move workloads from on-premises datacenters into public cloud, their responsibility shifts from Scope 1 and 2 into Scope 3; the cloud provider becomes accountable for Scope 1 and Scope 2 stewardship. Cloud carbon tracking is necessary because customers want to know the environmental impact of choices they make in their upstream supply chains.

The complementary nature of cloud spending discipline and meeting sustainability goals is natural given the easiest and most obvious cost management strategy: reducing waste. Organizations that bring legacy capacity planning practices into cloud are bound to overprovision cloud resources at first. Our data indicates that the longer a company has had a dedicated cloud financial management function in place, the more likely it is to have the visibility into application behavior needed to help the business set and meet sustainability goals. Among respondents who have been actively engaged in cloud financial management for more than four years, 72% indicate they have an active role in developing strategic sustainability plans and detailed knowledge of the monitoring tools used, versus 40% of those who have been engaged in cloud financial management for less than one year.

Of course, public cloud is just one element of a business’s overall power/energy usage, and companies have a variety of tools at their disposal for setting and tracking progress toward organization-wide goals. Because data inputs to such a system may come from a variety of sources, however, it’s not surprising that Excel spreadsheets (64%) are currently the most used tool for this purpose, followed by ESG/sustainability management software (61%) (see Figure 8). Momentum appears to be in favor of more specialized software, however — when we asked respondents which tools they plan to deploy in the next two years, ESG/sustainability software rose to the top.

Figure 8: Excel spreadsheets are currently the top tool for tracking sustainability metrics



Q. Which of the following software tools do you currently use or plan to use to measure, monitor and manage sustainability improvements?

Base: Organizations with a sustainability program in place (n=793).

Source: 451 Research custom survey, 2022.

Sustainability metrics currently being tracked are those readily available by reviewing utility bills: energy consumption (69%) and water usage (59%). But regarding adoption plans in the next two years, the drive is toward monitoring greenhouse gas emissions (45%) and waste (42%), which shows the market demand for specialized tools to measure these impacts.

Conclusions

As public cloud unit costs remain relatively stable in an inflationary economy, it should come as no surprise that spending on cloud as a whole is headed upward: 451 Research's Market Monitor service expects public cloud IaaS and PaaS spending to grow at a 16% CAGR over the next five years. Driven by more distributed workforces and customer bases and the need to satisfy a new generation of consumers expecting digital-first engagement, many organizations are transitioning a growing portion of their IT estates to public cloud infrastructure. Now that most companies have matured beyond the shadow IT stage and cloud services are becoming a growing portion of the IT budget, organizations are naturally looking to monitor and manage their cloud expenses to ensure that they're getting the most out of their investment.

Cloud providers and software vendors offer a host of tools to set budgets, alert about cost variances and remediate needless overspending. Some of the methods are easy (e.g., turning off resources during non-business hours or leveraging long-term discounts for predictable workloads), and some are difficult (refactoring applications to spin up resources only when needed or using spot instances for interruption-tolerant processing). The trick is to ensure that the value gained continues to outpace the money spent; to achieve this, organizations will want to establish business-relevant goals and rely on the full range of deployment options and pricing models to get the job done.


The study shows that the same teams responsible for financial discipline in cloud spending (i.e., IT) are also likely to be involved in setting and meeting sustainability goals. This is a natural alliance of purpose: waste is waste, and the efficiency gained by better matching compute resources to application needs can help meet both financial and sustainability goals.



Methodology

For this study, we fielded a web-based survey of 1,000 IT decision-makers globally. The sample included representation from a wide range of industries and respondents from 11 countries, including 325 from the Americas (U.S., Canada and Brazil), 275 from Europe (U.K., Germany and France) and 400 from Asia-Pacific (India, Japan, Australia, South Korea and China). All U.S.-based respondents were from organizations with minimum annual revenue of \$500M, at least 500 employees and public cloud spending of \$250,000 per year or more; non-U.S.-based respondents were from organizations with minimum annual revenue of \$250M, at least 250 employees and public cloud spending of \$100,000 per year or more. All survey respondents were vetted using a comprehensive set of screener questions to ensure their knowledge and role qualified them to answer the survey questions posed.





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Jean is an analyst working across the Cloud Transformation team and Digital Economics Unit of 451 Research, a part of S&P Global Market Intelligence. In addition to producing the quarterly Cloud Price Index deliverables, Jean covers vendors and cloud providers that offer technology or services to manage or improve public and private cloud TCO, performance or consumption. In the cloud-native universe, she focuses on container-native software, serverless architectures and service mesh.

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