

FinOps with Azure

Bringing FinOps to life through
organizational and cultural alignment



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Introduction



Moving to the cloud brings a new resource provisioning and cost structure that invariably changes the way you budget, allocate, and report IT costs. The variable cost model of cloud can be challenging to manage, but can also provide more granular control and visibility into your spend; letting you take advantage of cloud to maximize its business value.

FinOps is an evolving cloud financial management discipline and cultural practice that touches all facets of your business, from business and product groups, engineering, finance, and all the way to the executive suite.

In essence, FinOps involves everyone in the organization who manages cloud services. It changes the way you align teams and allocate costs among those teams, while driving visibility, best practices, accountability, and insights about their cloud usage.

Core to FinOps is the cultural change that occurs when cross-functional teams collaborate to drive business value from their cloud investments.

This e-book is designed to help organizations understand the cultural and organizational alignment changes the FinOps Framework (a set of best practices established by members of the FinOps Foundation) to maximize cloud business value. We'll guide you through the FinOps Principles to highlight Microsoft solutions and resources that will support your organization's cloud financial journey.



Predictability versus flexibility - the variable cost model of the cloud

Cloud spending is highly flexible. You're no longer incurring large up-front capital expenditures (CapEx) for purchasing and maintaining your own IT infrastructure. You're not provisioning new servers six or 12 months out in anticipation of capacity needs or provisioning them at a size predicted to meet your needs five years from now when they're done depreciating. Instead, spending on cloud services can be incremental, and can be exactly aligned to respond instantly to scale up or down depending on your capacity needs at any given time.

Shifting from centralized, all-up-front purchasing to an incremental shared cost model drives everyone to take ownership of their cloud spending and empowers them to optimize that spend. In many cases, the new pay-as-you-go pricing model changes the spending approval process for organizations. And new business metrics emerge, changing the way you forecast cloud spend, all requiring a new way to track and report cloud usage.

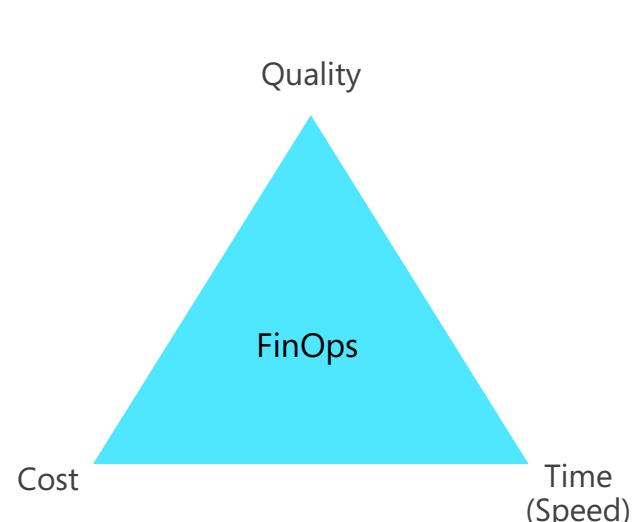
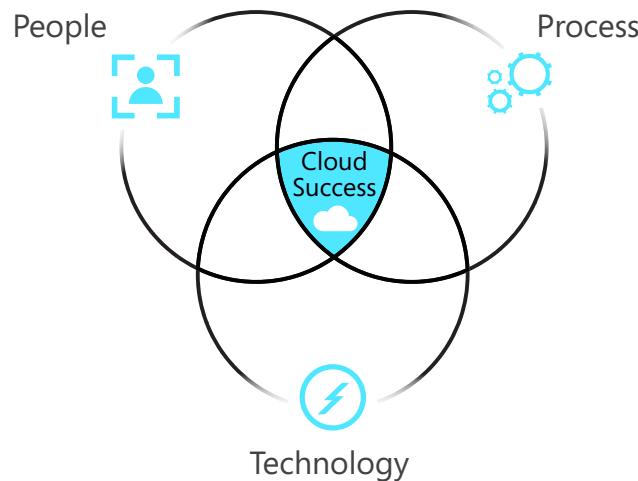
It means Finance must find new ways to gain back the predictability it had with the fixed-cost model. That's where FinOps practices come into play. When the organization is managing its costs at the team level, those teams need reporting mechanisms that include KPIs for their share of total costs, and also KPIs for unit cost measures for key services, and metrics that call attention to opportunities to create value.

It starts with visibility. Cloud costs can be incurred by any engineer of the organization at any moment. To effectively manage this consumption-based model, everyone in the organization, from developers to finance leaders, should understand and embrace the processes and policies that go into making cloud usage decisions based on what matters to the business. Such decisions usually require trade-offs to get the right balance of performance, availability, and cost. For the cloud to become a driver of innovation and revenue, those decisions cannot be made in silos.

Tradeoffs

Mastering the cloud is not just a technology, business, or system problem. It is multi-faceted, involving people, processes, and technology, and ultimately affecting the culture of the organization as a whole.

FinOps seeks to guide actions to maximize the value of cloud spend, but decisions must be made on an "Iron Triangle."



Tradeoffs must be made by balancing the company's goals in every case in terms of speed (time to market), quality (performance, reliability, availability) and cost. The goal of FinOps is not always to do things the cheapest, but to do things in the way that develops the most value.

What is FinOps?

FinOps is an evolving cloud financial management discipline and cultural practice that enables organizations to get maximum business value by helping engineering, finance, IT, and business teams to collaborate to take advantage of the variable cost model of the cloud.

At its core, FinOps is a cultural practice. It's the way for teams to manage their cloud costs, where everyone takes ownership of their cloud usage supported by a central best-practices group.

The [FinOps Framework](#), a set of best practices, standards, and guidance by the FinOps Foundation and its open-source community, is based on the following six principles which act as the north star objectives of the FinOps guidance.



Teams need to collaborate

Collaboration is the hallmark of FinOps. It's about cultural change and building a common focus on cost efficiency among the siloed teams that might not typically work closely together. Teams must work together in near real-time as the cloud operates on a per-resource/per-second basis. Collaboration is the engine that drives continuous improvement and fast decision-making.



Decisions are driven by the business value of cloud

Unit economics and value-based metrics demonstrate business impact better than aggregate spend. Make conscious trade-off decisions between cost, quality, and speed. Think of cloud as a driver of innovation, a driver of capability, and a way to improve speed to market and customer satisfaction.



Everyone takes ownership of their cloud usage

Accountability of usage and cost is pushed to the edge. Individual feature and product teams are empowered to manage their own usage against their own budgets. FinOps decentralizes the decision-making about resource usage and optimization. Technical teams must consider cost as a first-class requirement just as they would uptime or performance.



FinOps reports should be accessible and timely

Process spending, forecast, and efficiency data quickly and consistently, and provide visibility to all levels of the organization. Create, monitor, and improve real-time financial forecasting and planning. Focus relentlessly on clean data to drive decisions. Utilize internal team benchmarking as well as industry peer-level benchmarking.



A centralized team drives FinOps

Centralized management and executive sponsorship of FinOps practices are highly recommended. Centralized automation reduces duplicated efforts and makes it easier to govern and control committed use discounts and reserved instances with cloud providers. Engineers and operations teams need to stay focused on usage and not think about rate negotiations.



Take advantage of the variable cost model of the cloud

The variable cost model of the cloud should be viewed as an opportunity, not a risk. Just-in-time prediction, planning, and purchasing of capacity is preferred over static long-term procurement cycles. Make continuous small adjustments in cloud usage and optimization.

Next, we'll examine each of these principles, and the capabilities, functional activities, and Microsoft Azure solutions that can empower your organization to maximize cloud business value.

Chapter 1

Teams need to collaborate A centralized team drives FinOps

Microsoft solutions for these principles

-  [Microsoft Cost Management](#)
-  [Azure Policy](#)
-  [Microsoft Power BI](#)
-  [Microsoft Teams](#)
-  [Azure Monitor Workbooks](#)
-  [Azure Advisor](#)
-  [Microsoft Azure learning paths](#)



What these principles mean

Collaboration and a centralized team enable an organization to continuously improve its practice to gain efficiency and boost innovation.

A centralized FinOps team is the driver of FinOps. FinOps requires cross-functional teams to work together toward a common goal. With FinOps, cloud fiscal responsibility is shared between engineering, finance, technology, and business teams. An organization cannot be successful without all teams involved. Teams must collaborate to find the best balance between all objectives to support the single objective that matters: Business value. Working together as a cross-functional team creates accountability through the organization based on shared experience, terminology, and goals. Centralized FinOps practitioners can promote this collaboration, while performing specific capabilities, such as managing rate and discount optimization on behalf of the whole organization.

Ultimately, FinOps is about cultural change. It means finding ways to ensure teams work together to continuously improve on agreed-upon metrics for efficiency. And that makes education and enablement a key factor for facilitating effective collaboration to learn more about one another's disciplines to accommodate the speed with which we work. Teams must help define governance and parameters for cloud usage that provide some control while also ensuring innovation and speed of delivery can flourish alongside cost efficiency.



Why they matter

Collaboration improves the way teams work together and solve problems. This leads to more efficient processes, increased success, and improved communication. Without collaboration, decisions are based on partial data. By eliminating silos, collaboration drives faster adoption and innovation.

Success can only be achieved with inclusion, communication, and accountability. When teams collaborate, there is complete visibility into what the teams do, and everybody is on the same page with regard to cloud cost management. Collaboration fosters better alignment and innovation and helps prioritize investments in tooling and practices that drive cost accountability and efficiency. Effective collaboration can lead to guardrails and policies that are more effective because they include the perspectives of all the teams that operate within them. Team collaboration facilitates visibility, accountability, and healthy business operations. Each team brings a different perspective to solving complex problems. But working together allows them to build a consistent way to talk about these complex problems in ways that make them easier to address.

A centralized team removes negotiation discussions from key teams so they can focus on value-added efforts from a cost optimization perspective. It creates clear segregation of roles and responsibilities and drives alignment among IT and business teams.

"Teams need to collaborate very closely to find the best balance between all objectives to support the one single objective that really matters: Business value."

– Dirk Brinkman, Principal Cloud Solutions Architect, Microsoft

Key capabilities

-  [Establish a FinOps culture](#) – Creating a movement to establish cultures of accountability so that your organization understands that the practice of cloud cost management is really about leveraging FinOps to accelerate the creation of business value.
-  [Establish a FinOps decision and accountability structure](#) – Defining FinOps-related roles, responsibilities, and activities assigns accountability and identifies cloud cost management gaps between teams.
-  [Manage commitment-based discounts](#) – To maximize these discounts, team needs to closely collaborate and align in terms of forecasting and planning.
-  [FinOps education and enablement](#) – Allows all those participating in cloud adoption and FinOps practices to increase their understanding of cloud, FinOps, and the value it can bring to the organization.

Key milestones for building a FinOps culture of collaboration

Crawl	Walk	Run
Engineers are still learning what FinOps is and their role within it.	Engineers understand the importance of FinOps within the business.	Engineers consider financial impact during each lifecycle.
FinOps metrics are available to teams, but engineers don't actively use the metrics.	Teams monitor and optimize this metric.	Engineers actively look for FinOps opportunities. Engineers proactively confirm budget and highlight changes that will impact costs.
Finance and engineers are only just starting to meet.	Engineering and Finance are aware of each other and understand what motivators drive each other.	FinOps team advocates with Engineering teams for investment for solid financial endeavors.

[FinOps Maturity Model by FinOps Foundation](#)

Adopting these principles with Microsoft solutions

Microsoft supports these FinOps principles with the following solutions:

-  [Microsoft Cost Management](#) – Consider who from the business, engineering and finance teams needs to be included in budget alerts and what automation is appropriate. Support data visibility to allow collaboration and a centralized team.
-  [Azure Policy](#) – Help enforce organizational standards and to assess compliance at scale. Its compliance dashboard provides an aggregated view to evaluate the overall state of the environment, with the ability to drill down to the per-resource, per-policy granularity. It also helps to bring resources to compliance through bulk remediation for existing resources and automatic remediation for new resources.
-  [Microsoft Power BI](#) – Create, share, and consume business insights in the way that serves you and your role most effectively.



[Azure Monitor Workbooks](#) – Similar to Orphaned Resources Workbook and FinOps Insights Workbook, Azure Monitor Workbooks provide great insights on optimizing costs and help with house-keeping of Azure resources which can impact costs.



[Microsoft Teams](#) – Integrate the people, content, and tools your team needs to work together effectively.



[Azure Advisor](#) – Analyzes your resource configuration and usage telemetry and then recommends solutions that can help you improve the cost-effectiveness, performance, reliability, and security of your Azure resources.



[Microsoft Azure learning paths](#) – Learn new skills to boost your productivity and enable your organization to accomplish more with Microsoft Certifications.



Expert Tips

"Leverage the expertise of your FinOps team to train people, to establish a FinOps culture, to establish cloud cost-control guardrails and cost-tagging standards, create budgets and cost forecasts, develop tools and dashboards, and optimize organizational costs."

– Hamel Yigang, Principal Cloud Solutions Architect, Microsoft

"It starts with getting agreement from the business, finance, and engineering leaders that FinOps is important to your organization. With the right executive level sponsorship, you should be able to build out your FinOps team from subject matter experts across your organization. As you start to apply the FinOps Lifecycle, make sure you're reporting back your progress to your executive including why it's beneficial to your organization."

– Sonia Cuff, Cloud Advocate Team Lead, Microsoft

"Define internal governance between IT, Finance and Management to share KPIs and define objectives and processes."

– Cedric Dupui, Senior Cloud Solutions Architect, Microsoft

"Adopting these principles matter because it eliminates silos within the organization and brings executive, engineering, finance, procurement, business and product teams together to work with each other to address cost management in the cloud and in other areas."

– Madhav Lakshminarayanan, Senior Cloud Solutions Architect, Microsoft

"Collaboration is a key to develop accountability across a company."

– Mark Aggar, Principal TPM Manager, Microsoft

"Without collaboration decisions are based on partial data. It's like finance cutting costs without consulting with engineers first."

– Joseph Marino, Modern Service Management Solutions Architect, Microsoft

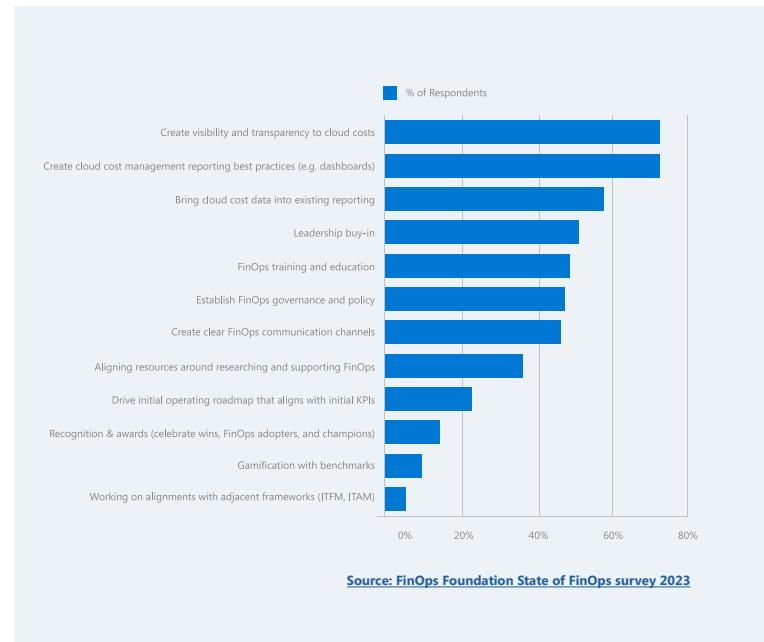
"You need to have accountability at each level of decision making, and it needs to come from the top. That should include accountability for workloads that generate revenue as well as workloads that do not generate revenue but are still critical for the business."

– Nelson Pereira, Director, Cloud Solutions Architect, Microsoft

Market research

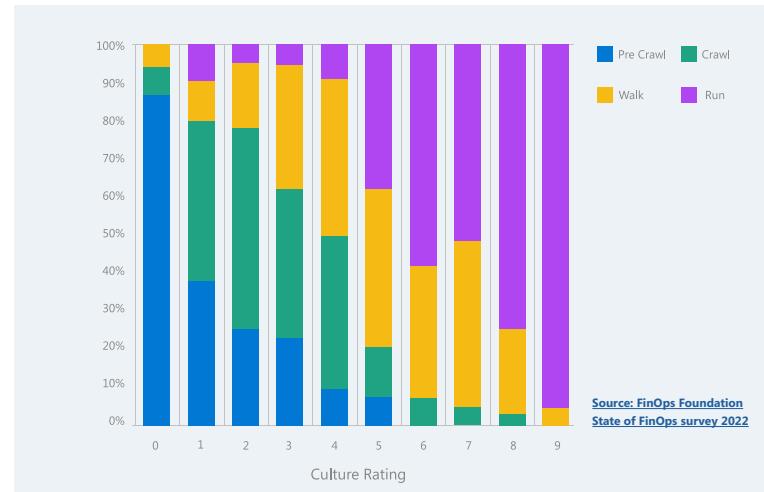
What initiatives does your organization use to establish a FinOps culture?

Respondents to the 2023 FinOps Foundation [State of FinOps](#) survey indicated that providing transparency and reporting around cloud costs are the most popular topics. However, 61.8% of respondents indicate they are still in the Crawl maturity phase.



Cultural strength grows with maturity

Newer FinOps members start out with little strength of culture. Spread throughout are Crawlers and Walkers starting to build their FinOps cultural momentum.



FinOps Foundation guidance

- Invest time and energy into fostering collaboration required by the introduction of FinOps.
- Encourage creativity, curiosity and collaboration among teams.
- Centralize control of rate negotiation, reserved instance and savings plan purchasing, and centralized policy and governance within the core FinOps team to free up time for engineering teams to focus on optimizing usage.
- Cloud use will be new to many resources in the organization, not just finance or engineering. Expect mistakes to be made and try to blamelessly examine why mistakes happen and how they can be avoided or minimized in the future to foster the innovation.
- Make a central team responsible for cloud spend, give them support in rallying and aligning the organization and make them accountable for organizational-level, as well as FinOps team results.

Chapter 2

Decisions are driven by the **business value of cloud**

Microsoft solutions for this principle

-  [Microsoft Cost Management](#)
-  [Microsoft Power BI](#)
-  [Well-Architected Review](#)
-  [Azure savings offers](#)
-  [Azure Advisor](#)
-  [Microsoft Azure learning paths](#)



What this principle means

Each operational team needs to access near-real-time data to influence their spend and help them make data-driven decisions that result in efficient cloud costs balanced against the speed and performance and quality and availability of services.

Using the concept of cloud unit economics to measure cloud spend against business output, organizations create and track business value metrics so that reports show the impact of their decisions.

With access to new capabilities, the cloud becomes a driver of innovation, which also factors into cloud value. Developing metrics that reveal the business value of your cloud spend allows you to attach growth in cloud spending to your overall business growth.

With trending and variance analysis, you can then make informed trade-off decisions among cost, quality, and speed for your cloud workloads. This data also informs an organization's KPIs and helps align forecasting models with desired business outcomes.

Why it matters

Cloud financial decisions based on business value cannot be made in silos. They require and enforce collaboration and turn discussions from money spent to efficiency and value of that spend. Your return on investment for cloud usage is then based on business metrics.

Internal team benchmarking drives best practices and helps form strong repeatable patterns that bring the most business value, while industry peer-level benchmarking helps determine how your company is performing.

Clear and consistent decision-making processes increase confidence and agility while reducing time to outcome and value.


“Cloud costs are like other technology costs, they’re only worthwhile if they’re providing a business capability that is more valuable than their cost.”
— Sonia Cuff, Cloud Advocate Team Lead, Microsoft

Key capabilities



Resource utilization and efficiency – Observing a resource's utilization over time to ensure sufficient business value for the cloud costs associated with each class or type of resource being consumed.



Data analysis and showback – The ability to leverage data to create a near real-time reporting mechanism for cost allocation, optimization, and value-based decision making.



Measuring unit costs – Developing metrics that reveal business value using cloud unit economics, a system of profit maximization based on measurements of how well your organization is performing against its FinOps goals and as a business overall.



Forecasting – The practice of predicting future spending in cloud must be based on a combination of historical spending and future plans at a team level. Future cloud infrastructure and application lifecycle changes may impact current budgets and influence budget planning and future cloud investment decisions.



Budget management – Strategic decisions on how to operate as a business and what to invest in are made based on budgets. If actual expenses do not match the budget, it can impact other decisions that were made based on those budgets.



Establishing a FinOps decision and accountability structure – Capturing an organization's roles, responsibilities, and activities to bridge operational cloud cost management gaps between teams and help cross-functional teams work out processes and decision trees.

Key milestones for cloud business decision-making

Crawl	Walk	Run
Establish a simple hierarchy of decision-making authority and accountability.	Decision and accountability structure and processes are well documented.	Standardized FinOps decision making processes are in place, utilizing agreed FinOps metrics.
Define efficiency metrics that support business improvements.	Mature product teams have implemented unit economics and can use them to tell effective cost management stories.	Unit costs for key services are developed and tracked over time for efficiency.
Users are tracking costs at the account level but are not using unit economics to measure their cost effectiveness.	KPIs are developed to measure the cost effectiveness of desired business outcomes.	Business and product owners understand that their design decisions drive cost.
FinOps metrics are available to teams but there is no set ritual followed by engineers around the metrics.	Leadership makes decisions based on the cost impact and business value.	Able to make proactive and predictive decisions based on business goals.

FinOps Maturity Model by [FinOps Foundation](#)

Adopting this principle with Microsoft solutions

Microsoft supports this value-based decision-making principle with the following solutions:



Microsoft Cost Management – Monitor and track usage patterns to continuously optimize costs and access rich operational and financial insights to make informed decisions.



Microsoft Power BI – Get up-to-the-minute analytics and create reports to share insights, foster collaboration and help make data-driven decisions on cloud value.



Well-Architected Review – Review an assessment tailored to your workload type with recommendations for optimization based on the five pillars of the Well-Architected Framework.



Azure savings offers – Find pricing benefits and savings plans such as Reserved Instances, Saving Plan for Compute, and Azure Hybrid Benefit.



Azure Advisor – Get actionable recommendations to help you optimize your Azure resources for reliability, security, operational excellence, performance, and cost.

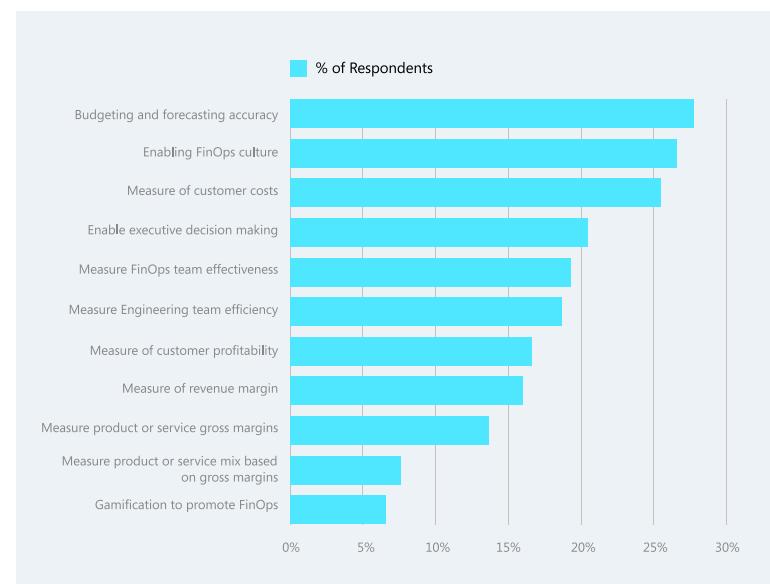


Microsoft Azure learning paths – Learn new skills to boost your productivity and enable your organization to accomplish more with Microsoft Certifications.

Research

Progress still needed for measuring unit costs

The majority of respondents indicate low maturity in their unit costs capability across key areas where unit costs can be incorporated.



[FinOps Foundation State of FinOps survey 2023](#)



Expert Tips

"Start with the quantifiable. I wouldn't say we're going to increase productivity by 20%. That's too fuzzy. But I could model out a 5% increase to overall revenue."

- Jeff Amels, Senior Cloud Solutions Architect, Microsoft

"Identify key roles and responsibilities. Form a team of decision makers. Assign ownership and hold everyone accountable for their role in team collaboration."

- Tanuja Shah, Senior Program Manager, Microsoft



FinOps Foundation guidance

- Use techniques such as trend analysis and variance analysis to understand variations in costs at a team and aggregate level. Comparing teams with themselves in the past can create the best indicator of both problems and efficiencies.
- Define unit economics for your cloud spend at both a technical and business level and build a robust reporting mechanism so that you can make good business decisions based on value.
- Benchmark against industry peers or organizations with similar usage patterns to see how you are performing and understand the challenges and solutions from other industries.

Chapter 3

Everyone takes ownership of their cloud usage

Microsoft solutions for this principle:

-  [Microsoft Cost Management](#)
-  [Azure Policy](#)
-  [Microsoft Power BI](#)
-  [Azure Advisor](#)
-  [Microsoft Azure learning paths](#)



What this principle means

With the multitude of cloud services offered, it's hard to imagine an organization that doesn't need to better segment and allocate costs to the users of those services (product and feature teams, lines of business, etc.). When costs are not properly allocated, no one has a complete picture of their true costs and cost overruns.

With FinOps, accountability of usage and cost must be pushed to the edge where the developers and engineers responsible for building cloud resources understands their responsibility in driving cloud value. Moving to the cloud requires fundamental changes to both mindset and behavior around existing financial management practices to embrace the variable cost model of the cloud.

Instead of looking at cloud usage as a fixed cost, technical teams learn to consider cost as a new efficiency metric which is tracked from the beginning of the software development lifecycle. This is not an intuitive change for many developers. Developing in the data center may not have exposed developers to using cost as a first-class requirement in the past. Building this awareness and appreciation for engineering in a cost-effective way will take time.

Individual feature and product teams must be empowered to manage their own cloud spending against their budget and make value-based decisions

within that scope. This shifts responsibility for cloud costs to the lines of business and those costs become part of the forecasting, planning, and operations for those business units. That transparency also increases awareness of IT's contribution to the business and provides an immediate feedback loop.

Why it matters

When teams are aware and responsible for their cloud spend, they can measure that spend against the business value it delivers and then focus investments in areas where cloud usage can improve the business. Engineering teams know their environments best, and using unit economic KPIs, can select and continually shift their cost profile, architectures, service choice and operating models to align with changing business needs.

Managers can implement team-level KPIs and track against targets, and finance teams will understand how to correctly allocate usage costs to the business units. FinOps teams can prepare reporting and data visualization to keep leadership informed of cloud business value.

"Cloud fiscal responsibility is shared between the cloud platform team and the workload teams. A customer cannot be successful here without both teams involved."

— Rob Kuehfus, Principal Program Manager, Microsoft



Key capabilities

	<p><u>Resource utilization and efficiency</u> – Ensuring there is sufficient business value for the costs associated with each resource being consumed by observing that utilization over time to understand if the performance, availability, and other quality metrics in line with the expense incurred.</p>		<p><u>Data analysis and showback</u> – Leveraging cloud usage data to create near real-time reporting which calls to attention the total costs for the business entity, opportunities for cost avoidance, and the organization's KPIs for financial health.</p>
	<p><u>Cost allocation (metadata and hierarchy)</u> – Establishing a consistent hierarchy of accounts with resource-level metadata to divide up consolidated cloud service provider invoices among various IT groups who use cloud within the organization.</p>		<p><u>Managing shared cost</u> – Without appropriately splitting costs that are shared, engineers and product managers lack a complete picture of how much their products are really costing.</p>

Key milestones for decentralizing ownership of cloud usage

Crawl	Walk	Run
Cost allocation metadata has been established.	Shared platform owners are able to produce showback costs generated by internal customers.	Shared platform/service owners are able to fully allocate and chargeback costs.
Product owners and engineers are still unaware of their portion of shared costs.	Product owners and engineers are aware of their portion of shared platform/service costs.	Product owners and engineers include shared costs as part of their forecasting and planning.
Owners are not able to determine costs generated by internal customers.	Shared costs are split using an appropriate distribution model(s).	Shared cost processes and workloads are automated.

[FinOps Maturity Model](#) by [FinOps Foundation](#)

Adopt this principle with Microsoft solutions to help push accountability to the edge:

	<p><u>Microsoft Cost Management</u> – Distributing responsibility for cloud costs is a complex and ever-shifting task. This service provides the reports to help you monitor and analyze cloud spending, manage budgets, export data, and act on recommendations to optimize costs. Implement governance policies for effective enterprise cloud cost management, and increase accountability with budgets, cost allocation, and chargebacks.</p>		<p><u>Microsoft Power BI</u> – Visualize and share your cloud usage data with reports customized to your specific KPIs for data-driven decision making.</p>
	<p><u>Azure Policy</u> – Set guardrails throughout your resources to help control and optimize your cloud spend and practice consistent resource governance to get more value from your investment.</p>		<p><u>Azure Advisor</u> – Personalized recommendations to optimize resources, reduce costs and increase efficiency and performance of your cloud investments. You can use Azure Advisor to target recommendations to specific subscriptions and resource groups for more fine-grained visibility into how the recommendations impact your cloud users.</p>



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Research

FinOps priorities

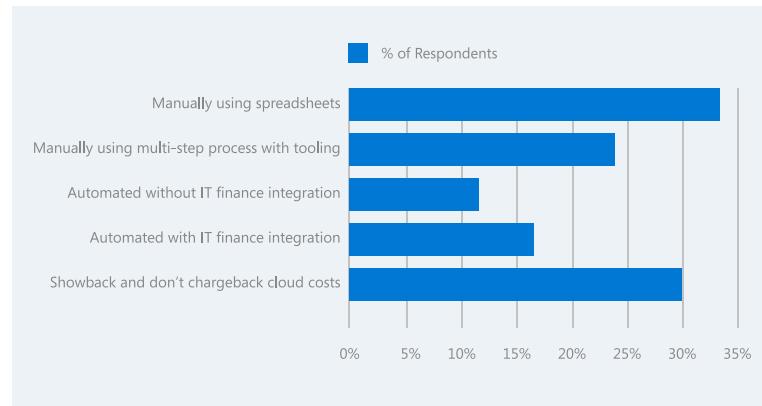
Cost allocation remains a top priority while establishing a FinOps culture and resource utilization and rightsizing increased in importance for FinOps practitioners.



Source: [FinOps Foundation State of FinOps 2023 survey](#)

How chargeback is being implemented

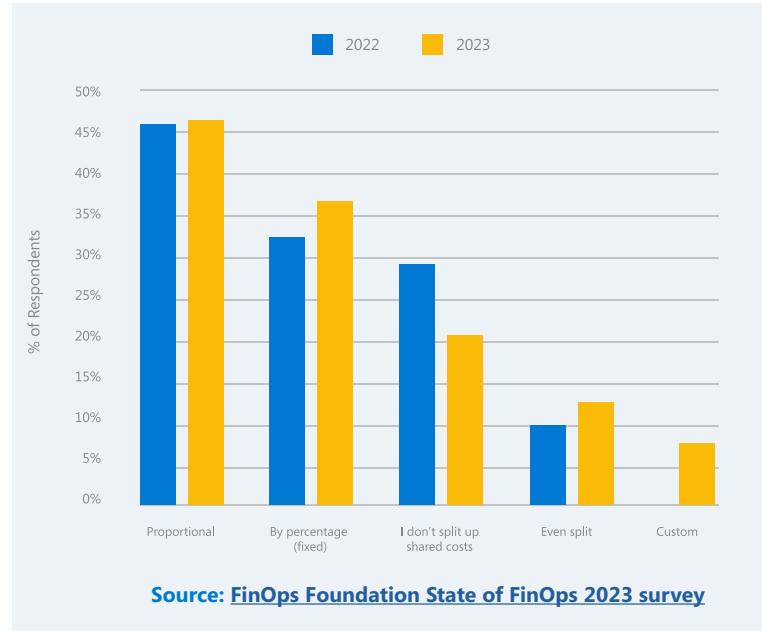
Respondents seem to continue to rely on manual methods to facilitate chargeback, followed by those who report not doing this at all, indicating that practitioners still have a journey ahead for automating these tasks.



Source: [FinOps Foundation State of FinOps 2023 survey](#)

More organizations are managing shared costs

The survey shows that FinOps practitioners are building a competency for allocating cloud costs using a weighted cost sharing model.



Source: [FinOps Foundation State of FinOps 2023 survey](#)



Expert Tips

"Tagging, tagging, tagging. Without an effective tagging strategy, there is no real visibility into cloud spend."

– Madhav Lakshminarayanan, Senior Cloud Solutions Architect, Microsoft

"We will analyze your performance and your consumption for that workload, and then we can say 'look, you're not using all of the capacity that this SKU provides from a memory perspective or a compute perspective.' So, we can probably downgrade you and save on cost."

– Nelson Pereira, Director, Cloud Solutions Architect, Microsoft

"The centralized FinOps teams requires leadership sponsorship to ensure that the policies, procedures and processes are followed by the organization."

– Joseph Marino, Modern Service Management Solutions Architect, Microsoft



FinOps Foundation guidance

- Clearly communicate and train on the culture of accountability with everyone who can impact cloud spend. Engineers must feel ownership not to cut costs, but to make good value decisions within their scope of control.
- Make sure resources are properly tagged and well organized to ease accountability so that everyone can take immediate actions against their cloud usage.
- Ownership of cost as one of the technical requirements of software should be established clearly by management collaboratively across disciplines, and at all levels of management.
- Define clear roles and responsibilities, provide continuous learning, and use tools to improve visibility.
- Communicate goals and objectives for engineering teams using unit economics to allow developers the ability to innovate within their scope of control and help achieve the overall value objectives.

Chapter 4

Reports should be accessible and timely

Microsoft solutions for this principle:

-  [Microsoft Cost Management](#)
-  [Azure usage and charges](#)
-  [Microsoft Power BI](#)
-  [Microsoft Azure learning paths](#)



What this principle means

Moving at cloud speed means today's cost data can be very different than it was three days ago. But adjustments can have an impact just as quickly. Cloud use is advancing and changing so fast it doesn't make sense to wait until the end of the month to report. Accessible and timely reports create fast feedback loops that result in more efficient behavior. In the context of FinOps, this work will typically focus on cloud cost and usage data.

This principle therefore relies heavily on adequate data ingestion and data normalization capabilities. FinOps encourages teams to process and share cost data as soon as it becomes available. This real-time visibility autonomously can drive better cloud utilization, helps determine if resources are under-or over-provisioned, and provides consistent insights into cloud spend to all levels of the organization.

An organization that can create, monitor, and improve real-time financial forecasting and planning can easily see where and why costs increased. At the same time, it enables internal team benchmarking, allowing the team to drive best practices and celebrate wins. On an industry-level, this benchmarking allows you to assess your company's performance in relation to peers.

the visibility required to determine how your resources are performing, while trending and variance analysis help explain cost fluctuations.

Reporting is also a powerful way to improve transparency and showcase visibility from top to bottom and vice versa. To optimize cloud usage, you need to understand what is consumed and who is consuming it. It's also about taking ownership and accountability. Every individual should be able to see their usage reports and understand their financial impact.

When you process cost data quickly and consistently, you can benefit from better cloud utilization. It allows you to take advantage of the variable cost model and improve real-time financial forecasting. When visibility into cloud spend is provided to all levels of the organization, you achieve better FinOps team collaboration, enabling everyone to take ownership of their cloud usage and enabling data-driven decisions based on cloud business value.

Clear and timely reports allow organizations to operate proactively because they support and inform real-time decision making as well as critical reporting mechanisms such as showback and chargeback.

Why it matters

There's no control and optimization without information and data. If you aren't looking at your cloud costs frequently, you are certainly wasting money by letting waste exist for longer than necessary. Enabling stakeholders to visualize data quickly, when they need it, means they have the most accurate data to review and act on. Adopting this principle provides


"Create a reporting schedule for each business area. Review the reports with a centralized team. Identify corrective actions where needed."

- Tanuja Shah, Senior Program Manager, Microsoft

Key capabilities



[Data ingestion and normalization](#) – Process and transform data sets to create a queryable common repository for your cloud cost management needs.



[Forecasting](#) – Understand how future cloud infrastructure and application lifecycle changes may impact current budgets and influence budget planning and future cloud investment decisions.



[Managing anomalies](#) – Detect, identify, alert, and manage unexpected or un-forecasted cloud costs in a timely manner to minimize detrimental business impact.



[Budget management](#) – To make decisions on how to operate as a business, what to invest in and other strategic decisions made based on budgets. If actual expenses do not match the budget, it can impact operations and other decisions that were made based on those budgets.



[Data analysis and showback](#) – To create a near “real time” reporting mechanism for stakeholders.

Key milestones for accurate and timely reporting

Crawl	Walk	Run
Match granularity of cost and usage data on incoming source files, though reporting separately.	Ingest data from multiple data sources, normalizing cost metrics.	Consistent data lake of usage, cost, performance, utilization data; sharing with other disciplines across the org.
Ensure metadata being applied to hierarchy and resources is consistent across cloud providers and data sources.	Ability to create consistent reports for different clouds, possibly using different reports.	Ability to run a single report with multiple clouds.

[FinOps Maturity Model by FinOps Foundation](#)

Adopt this principle with Microsoft solutions

Microsoft supports this FinOps principle with the following solutions:



[Microsoft Cost Management](#) – Monitor, allocate and optimize the cost of Microsoft Cloud workloads.



[Microsoft Power BI](#) – Analyze and manage Azure costs in Power BI.



[Azure usage and charges](#) – Download a daily breakdown of Azure usage and charges in the Azure portal.



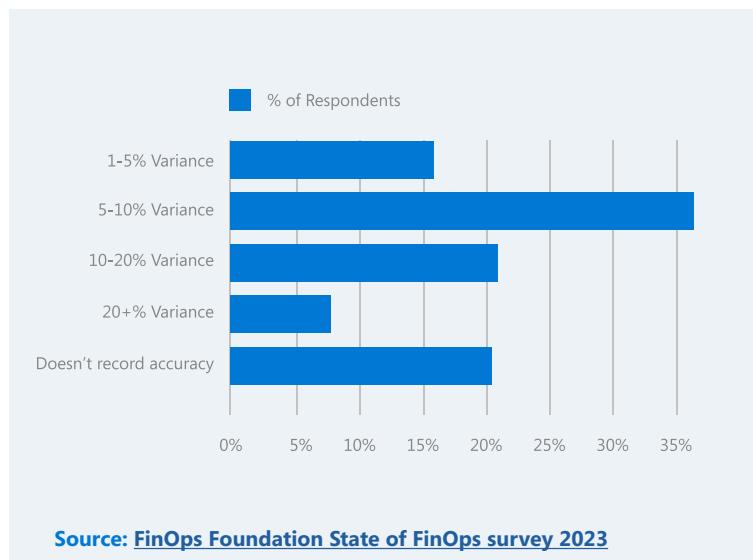
[Microsoft Azure learning paths](#) – Learn new skills to boost your productivity and enable your organization to accomplish more with Microsoft Certifications.



Market Research

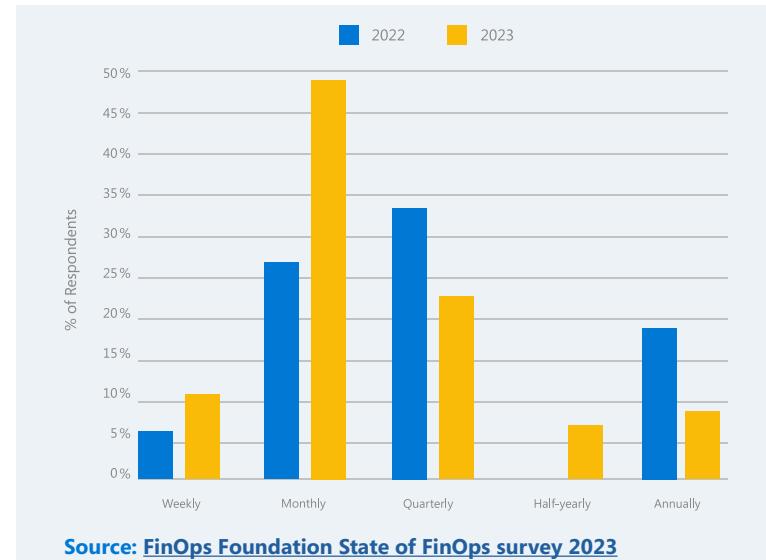
Variance between budget and actual spend

2023 FinOps Foundation research found 48.5% of respondents at Crawl maturity reported their variance rates between budget and actual cloud spending. This means that among the respondents, there's room for growth in the maturity of the Budget Management and Forecasting capability.



Forecasting is happening more frequently

Compared to 2022, frequency of forecasting has increased, with a 52% decrease in respondents doing annual forecasting and the biggest increase in those forecasting monthly. This indicates this capability is maturing with over 50% showing they are at Walk or Run levels.



Expert Tips

"When the showback model evolves into a chargeback type of reporting model, the IT organization is almost shifting from a cost center to an internal profit center and is able to represent revenue streams attached to the company, and it gets pretty exciting for a CTO."

– Jeff Amels, Senior Cloud Solutions Architect, Microsoft

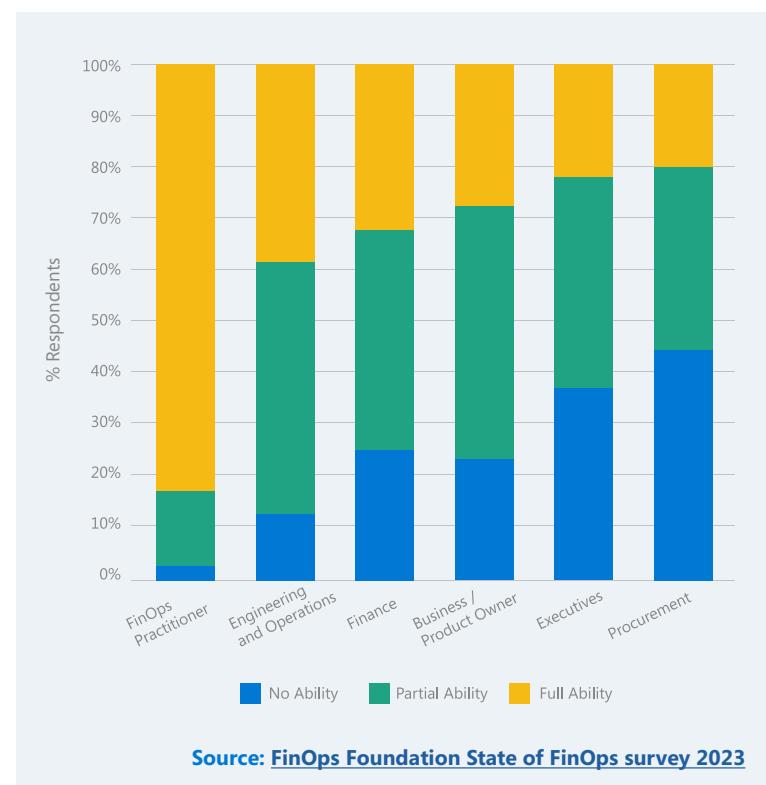
"Referring to Prius-Effect, share visual reports and KPIs, we all have unconscious bias to stay in the green zone."

– Cedric Dupui, Senior Cloud Solutions Architect, Microsoft



Who can self-serve cloud costs reports?

A majority of respondents report that their FinOps Practitioners are enabled to self-serve cloud cost reporting.



FinOps Foundation guidance

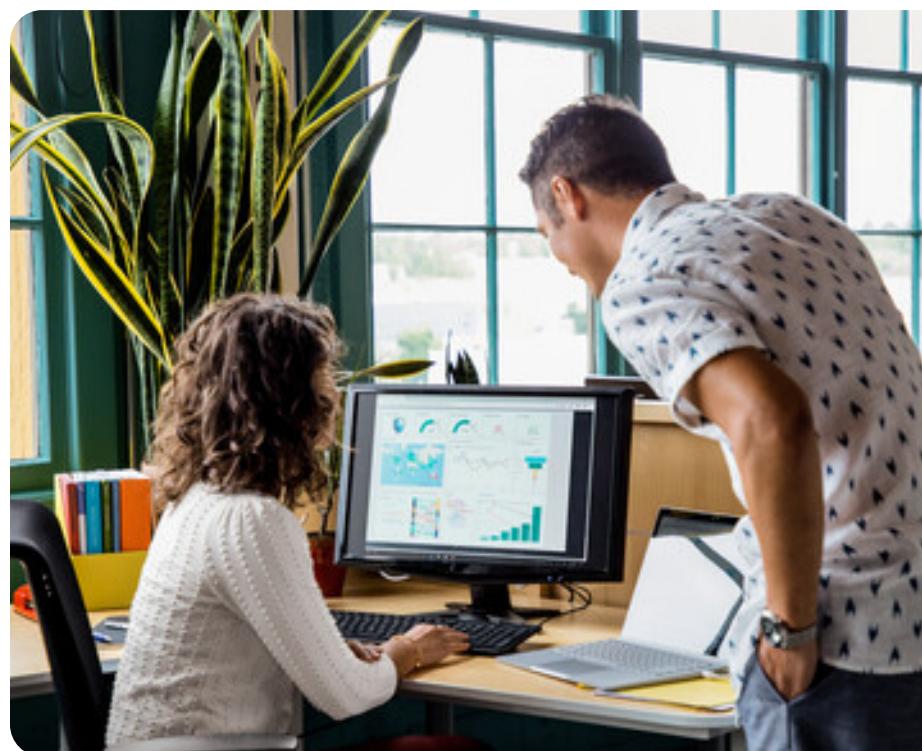
- Many organizations already have excellent reporting teams, tools, and processes in place.
- Leverage these groups and their experience if possible and help them understand how to use the large volumes of cloud data they may not be familiar with managing.
- The more consistent your reporting is, less changes will have to be communicated to everyone using it.
- Existing reporting may provide key cost allocation tags, summarization rules or terminology for a FinOps team to use more broadly.
- Ask each of your points of contact for the most useful reports they leverage.

Chapter 5

Take advantage of the variable cost model of the cloud

Microsoft solutions for this principle:

-  [Microsoft Cost Management](#)
-  [Azure savings offers](#)
-  [Azure Advisor](#)
-  [Microsoft Azure learning paths](#)



What this principle means

The shift from fixed to variable spending changes the way you manage and report costs, but those changes should be embraced as an opportunity to deliver more business value. The pay-as-you-go nature of resource provisioning means budgets can be set and shifted according to changing business priorities.

A variable cost model provides the opportunity to lower operational costs by reducing wasted capacity and the manpower needed to maintain system infrastructure. Your cloud resources are individually charged in micro amounts, providing level of usage granularity that enables showback and chargeback to specific business units and individuals. This further enables business agility with just-in-time prediction, planning, and purchasing of cloud capacity.

This translates into an agile, proactive system design process with iterative planning and continuous optimization. With just-in-time purchasing, you don't need to provision six months, or 12 months out. For your organization, it means that depreciation and amortization are no longer tied to your capital expenditures, so your key performance indicators (KPIs) will shift to focus more on cash flow. This model also enables you to apply special offers and rightsizing methodologies to further drive usage savings.

Why it matters

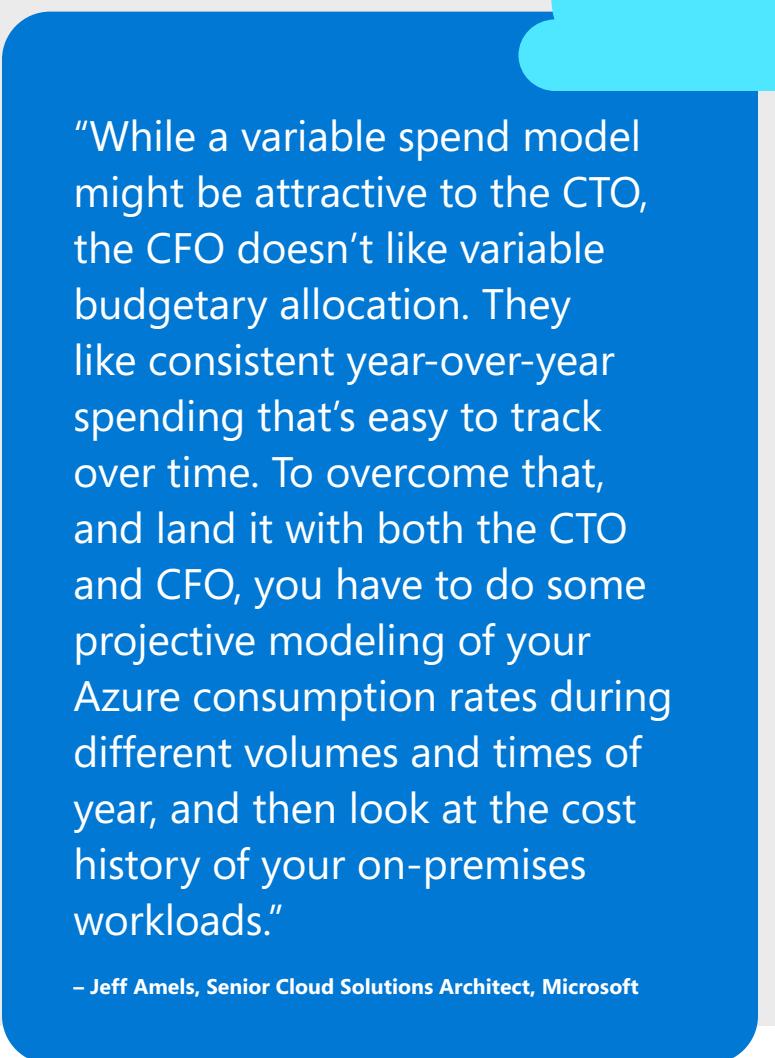
The use of consumption-based services like public cloud or SaaS offerings creates the potential for organizations to achieve massive scalability, global availability, and meet other critical use cases they might not even be able to build in a data center.

But resources used in the cloud are loaded with all the costs of operating the cloud data centers they run in, so being cost efficient means using resources only when they are needed.

Cloud allows the organization to quickly adapt its spend to support business-critical use cases, and scale that usage for particular workloads when needed.

Applying resources as needed accelerates time-to-value and drives agile processes for planning by promoting iterative budget allocation and forecasting.

This resource usage agility enables you to prioritize spending when time-to-delivery is important, and re-allocate spending when usage is less urgent.



"While a variable spend model might be attractive to the CTO, the CFO doesn't like variable budgetary allocation. They like consistent year-over-year spending that's easy to track over time. To overcome that, and land it with both the CTO and CFO, you have to do some projective modeling of your Azure consumption rates during different volumes and times of year, and then look at the cost history of your on-premises workloads."

— Jeff Amels, Senior Cloud Solutions Architect, Microsoft

Key capabilities

-  [FinOps education and enablement](#) – Providing training, events, internal communications, and other learning experiences to accelerate FinOps adoption.
-  [Establishing a FinOps decision and accountability structure](#) – Capturing FinOps-related roles, responsibilities, and activities to build decision-making and accountability structures and bridge operational cloud management gaps.
-  [Resource utilization and efficiency](#) – Ensuring there is sufficient business value for the cloud costs associated with each class or type of resource being consumed. Resource utilization, efficiency and cost must be looked at together.
-  [Forecasting](#) – Understanding how future cloud infrastructure and application lifecycle changes may impact current budgets and influence budget planning and future cloud investment decisions.
-  [Workload management and automation](#) – Giving FinOps teams the ability to match supply to demand most efficiently by creating the mechanisms to automatically adjust what resources are running at any given time.

Key indicators of variable cost model management

Crawl	Walk	Run
Users are tracking costs at the account level.	Tagging is fully defined and communicated to the user community.	Users are tracking costs by tags and tagging is governed and compliance is at high levels.
Cloud spend is allocated to teams based on estimated usage of resources.	Strategy implemented on how to show and allocate shared costs and discounts.	Chargeback and showback reporting is integrated automatically into the companies IT finance tooling.
Cloud spend is allocated to teams based on estimated usage of resources.	Ability to put a dollar value against costs that can be avoided by rightsizing underutilized or inefficient resources.	Uses cost and utilization data to drive automated processes.
Has some visibility into resource utilization and efficiency such as billing data and tools from a cloud provider.	Accounts, projects, or subscriptions are identified by metadata or a naming standard as belonging to specific cost centers.	Multiple sources of data are being brought together to effectively allocate shared costs.

[FinOps Maturity Model by FinOps Foundation](#)

Adopt this principle with Microsoft solutions

Consider the following Microsoft cost management solutions to help your organization take advantage of the variable cost model:

-  [Microsoft Cost Management](#) – Monitor and track usage patterns across multiple resources to continuously optimize costs and.
-  [Azure savings offers](#) – Find pricing benefits and savings plans such as Reserved Instances, Saving Plan for Compute, and Azure Hybrid Benefit.
-  [Azure Advisor](#) – Get actionable recommendations to help you optimize your Azure resources for reliability, security, operational excellence, performance, and cost.
-  [Microsoft Azure learning paths](#) – Learn new skills to boost your productivity and enable your organization to accomplish more with Microsoft Certifications.

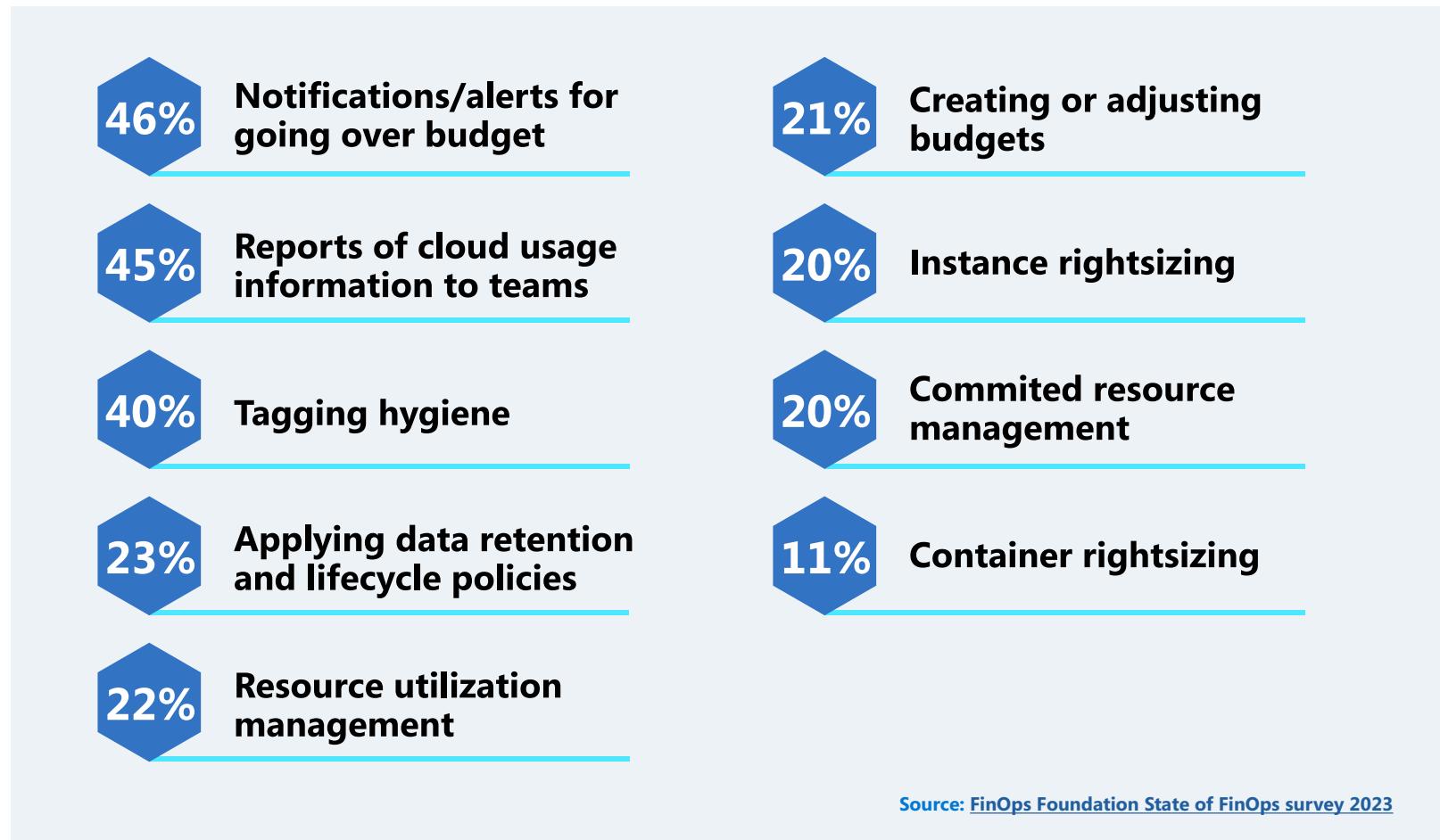


Market Research

Workload management and automation

Respondents in 2022 reported an increase in automation compared to previous data. From all our respondents who automate, budget overage notifications, reporting, and tagging hygiene are the most common things to automate. Runners led

the way in automation involving rightsizing, containerization, and making the most of savings plans and discounted rates.



Expert Tips

"If you want to take advantage of the variable cost model of the cloud, my recommendation is to study and apply the principles and recommendations of the Azure Well-Architected Framework."

– Dirk Brinkman, Principal Cloud Solutions Architect, Microsoft

"To drive as much business value to the cloud an organization needs to understand how to take advantage of cloud PaaS services and automation."

– Rob Kuehfus, Principal Program Manager, Microsoft



FinOps Foundation guidance

- In addition to business level KPIs, establish application specific KPIs to measure the efficiency of individual applications or services to encourage teams to drive utilization of their resources up, and encourage them to shut things off when not in use.
- Use automation and governance controls to create defaults that turn off things that are not required to run.
- Establish reporting of utilization in combination with observability teams to map cost to utilization across meaningful measures.
- Consider architectural models such as containers and serverless to only use resources when they are needed, and to drive maximum efficiency in key services.
- Use and automate scaling to automatically rightscale the resources available to an application as it cycles through periods of demand.
- Be sure when moving an application to cloud that it can take advantage of the scaling cloud offers or consider refactoring or rearchitecting those that can't.





The [FinOps Foundation](#) is a directed Project of the [Linux Foundation](#) dedicated to advancing people who practice the discipline of cloud financial management by providing community, career advancement and best practices. The FinOps Foundation is a 10,000+ strong global community, representing more than 3500 companies. It provides a variety of training and certification programs including the [FinOps Certified Practitioner](#) designation. It counts dozens of major service and platform providers including Microsoft Azure as part of its [partner certification programs such as FinOps Certified Platform and FinOps Certified Service Provider programs](#).

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