

Cloud Cost Management and FinOps

May 2023



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CCM Highlights and Trends

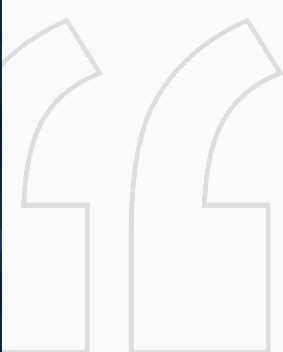
- **Recent survey data indicates that cloud investment will continue at a fast pace, but there will be more focus on management and optimization of cloud infrastructure.** Our recent survey of IT managers and CxOs indicates that 47% of those surveyed plan to accelerate or keep the pace of cloud investment, with 28% focusing on solutions that can help them save costs.
- **Concerns about cloud cost management (CCM) are rising.** In our work with enterprise end users, we are hearing more concerns about CCM, as the economic slowdown and rising interest rates have raised concerns about managing of cloud infrastructure costs. This has also surfaced in multiple surveys, by Futuriom and other research groups.
- **Better cloud visibility is needed.** Increased visibility will enable management teams to make better decisions about cloud services – such as which services are cheaper or better.
- **Specialized cloud infrastructure technology such as cloud networking and analytics will play a key role in CCM.** Futuriom has noticed that multicloud networking companies have recently picked up on the focus on CCM and are launching more visibility and CCM products and features.
- **Cloud compliance and visibility are also top of mind.** Cloud management has reached a new phase of awareness at the C-level and board-level, driving new demand for technology platforms that can identify the costs, security risks, and needs for automation in cloud infrastructure.
- **Cloud management teams are weighing repatriation decisions.** With the costs of public-cloud services under the microscope, the use of compute on premises may become more appealing – potentially accelerating the trend toward cloud repatriation.
- **New CCM, FinOps, and multicloud management tools will expand to help manage and mitigate cloud costs.** Futuriom has identified a group of new tools and vendor delivering CCM, multicloud, and hybrid cloud visibility.
- **Companies mentioned in this report:** Apptio, Aviatrix, CAST AI, CloudZero, Flexera, IBM (Turbonomic), Kubecost, Prosimo, Snow Software, Ternary, Virtana, VMware, Yotascale, Zesty



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1. Introduction: Cloud Costs Under the Microscope

Cloud providers claim to provide simple and economical services, but the reality is that for most companies, cloud services are neither cheap nor simple; in fact, in many cases they turn out to be expensive and complex. There is also evidence that as economic pressures increase and profitability comes under the microscope, enterprises are now taking a much closer look at the costs of running public cloud infrastructure and comparing it to alternatives, such as on-premises infrastructure.

This is not to say that the cloud has not lived up to its promises. Cloud services do allow companies that have little interest in running their own datacenter(s) to avoid that headache. Likewise, cloud services also enable tech teams to focus less on managing IT resources and more on developing and evolving new products/services. Furthermore, cloud services help finance teams to move substantial portions of their compute and storage costs from long-term capital spending (capex) investments to variable, and theoretically more manageable, operating (opex) costs.

At the same time, regardless of how much flexibility the cloud can introduce into a business, the costs associated with that flexibility will always matter. For cloud-native companies, the cloud bill largely amounts to the company's cost of goods sold (COGS). For so-called "brick and mortar" companies, tapping the advantages that the cloud has to offer can often be the key to keeping pace with their younger, more nimble competitors. But spending wisely on innovation is an evergreen challenge that many companies are far from good at managing.

Today, purchasing compute and storage-as-a-service can quickly become unpredictable as companies realize that, as with all as-a-service models, cloud offerings are designed to make use easy and seamless, while pricing schemes are designed to be complex, opaque, and largely indisputable. As with software as a service (SaaS) offerings, platform as a service (PaaS), and infrastructure as a service (IaaS) IaaS billing overages leave little recourse. Usage happens, it gets tracked, a bill is sent, and the company has to pay it.

In addition, the cloud computing service model is still quite new – with cloud companies such as Amazon Web Services (AWS) and Microsoft Azure enjoying huge profit margins. In a recent trend, customers are pushing back on these margins. For example, Amazon recently disclosed that its operating margins for AWS fell more than five percentage points year-over-year to 24%, whereas margins had previously been above 30%.

In the past year, the economic environment has changed remarkably. The COVID technology

boom, produced by low interest rates, government stimulus, and trends such as remote work and digitalization, produced enormous growth – but the economy is notably slowing. Rising interest rates have normalized technology investment expectations, and large technology firms have been cutting back on expenses and headcount. In conjunction with these trends, chief financial officers (CFOs) are taking a red pen to technology budgets – and we expect public cloud services costs to come under the microscope.

The need to deal with mushrooming cloud complexity and cloud costs is the reason we are writing this report. Throughout these pages we'll explore the reasons why cloud complexity has become an untamed beast in many, if not most, companies today. We'll then dive into remedies that companies have at their disposal to first rein in cloud costs and, before long, to make business and engineering decisions based on cloud economics. Finally, we'll end by profiling leading cloud cost management (CCM) solution providers and highlighting their approach to helping their customers to optimize existing cloud spend and make smarter decisions about future cloud initiatives and longer-term strategies.

2. Cloud Cost Challenges and Questions

As more companies are moving more workloads into the cloud, costs can quickly increase by orders of magnitude. More importantly, understanding these cloud costs can be a complex endeavor. Even for companies that have less than 50% of their workloads in the cloud, the costs of maintaining their cloud presence has risen to become a critical C-suite priority.

With economic conditions slowing and the CFO offices becoming more hawkish, it's clear that organizations are going to take a closer look at their cloud spending. They will also be looking for new tools that help them gain visibility into these costs.

At the same time, our data has been tracking interest in multicloud and hybrid cloud architectures that can help enterprises “take back control” of their clouds. They would like to manage and control their own cloud infrastructure without being locked into specific cloud providers. In addition, new edge use cases such as edge compute will rekindle interest in on-premises cloud.

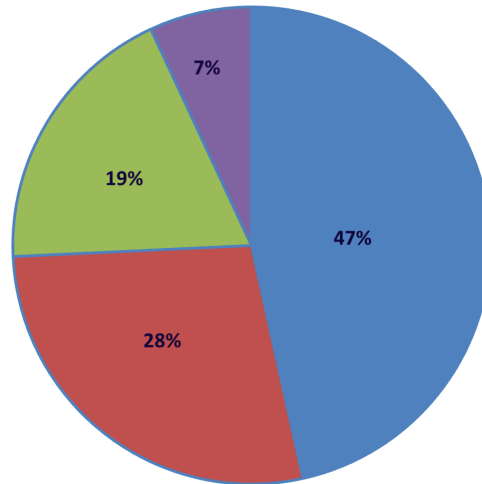
In this section, we'll review some of the top concerns and challenges for managing cloud costs and complexity. They include:

- Understanding cloud usage and complexity
- Need for visibility and compliance
- Cloud networking impacts on cost
- Managing FinOps and business unit expense
- The right location for Kubernetes and compute

Understanding Cloud Usage and Complexity

The business reasons for cloud adoption are many: speed, agility, time-to-market for innovation, among others. This logic is sound under all economic circumstances. However, against the backdrop of interest rate uncertainty, bank failures, ongoing geopolitical turbulence, etc., the need to tap competitive advantage wherever it may be found is even more important. Turning to our recent survey of 220 IT executives, all direct-level and above, nearly half (47%) plan to accelerate cloud adoption even as economic uncertainty prevails. In the next largest group, 28% said they would emphasize specific cloud architectures and networking solutions that can help implement cost savings. Only 19% said they were slowing adoption of cloud architectures and networking solutions, and 7% said the current environment has no effect at all.

How will the current environment effect your adoption of cloud infrastructure and services?



- We will accelerate our plans for cloud architectures and networking solutions
- We will emphasize specific cloud architectures and networking solutions that can help implement cost savings
- We are slowing our adoption of cloud architectures and networking solutions
- It has no effect at all

This might bring you to the next question: If organizations want to accelerate cloud deployment but become more cost conscious, how will they do so? The answer is that they need a CCM and FinOps strategy to observe, analyze, and manage cloud costs.

Businesses cannot simply spend money arbitrarily in the name of being innovative during tough economic times. Survey data across the industry – including our own survey data – confirms that managing cloud costs has become an urgent matter.

Need for Visibility and Compliance

CCM and FinOps technology will help organizations get a handle on better visibility. Increased visibility will enable management teams to make better decisions about cloud services – such as which services are cheaper or better. It will also enable them to weigh decisions about repatriation – the transfer of cloud technology back on premises, into a private cloud infrastructure they can control better. Expect the debate about repatriation to gather steam as CCM and FinOps tools enable organizations to better understand their cloud costs.

The first step to understanding costs is to track and analyze them. Easier said than done. Many cloud services are still purchased in ad-hoc ways or by business lines operating in the “shadow

IT” model. CEOs and CFOs are looking to put an end to this.

Platform tools, such as IBM’s Turbonomics or CloudHealth from VMware, integrate easily into each vendor’s larger suites and provide some level of visibility into usage as it is happening. However, they generally stop short of providing information that is useful for cost remediation conversations between finance and engineering teams.

Today, as many companies are dependent on a more complex cloud operating structure -- more cloud data, more cloud suppliers, better cloud data management needs, better cloud security needs, etc. -- the financial implications of the myriad of daily decisions can have a profound impact on a company’s cloud bill and its overall operating budget.

Cloud Networking Impacts on Cost

The networking world has big potential to add to understanding of cloud costs. After all, all cloud services are connected by networking infrastructure and services, which gather valuable data about usage.

In addition, the growing complexity of cloud networking – especially in multicloud environments – means that managers need to understand what type of network connectivity is needed and how it behaves. For example:

- Is cloud traffic being unnecessarily backhauled or hairpinned across networks?
- What is the impact of SaaS and public cloud services on overall network health?
- How can networks be built to more efficiently secure and connect cloud services?

Cloud networking companies such as Aviatrix and Proximo have realized that networking is a key enabler of cloud. It’s also a lever that can be used to provide better visibility and management of access to cloud services. After all, all cloud services are connected by networks. Aviatrix’s CostIQ uses distributed telemetry to measure usage of shared cloud networks and assign the results to appropriate cost centers. In addition to providing application-level network use, Proximo is building new tools to help customers view and understand cloud costs at the network level.

Managing FinOps and Business Unit Expense

As businesses develop better processes to understand cloud costs, they will also need to find ways to deliver this information across the organization. The first step is for organizations to prevent cloud from being a shadow-IT cost, while the second is to automate ways to gather and analyze this information.

The typical functions in a FinOps model for cloud include measuring unit costs (cloud, compute, and networking), forecasting, data ingestion, cost allocation, data analysis, and automated responses to anomalies.

One key challenge is how to allocate shared cloud costs, whether compute, network, or storage, across an organization. Without properly allocating these costs, nobody knows what products or services really cost.

The Right Location for Kubernetes and Compute

The Kubernetes revolution is in full swing, and it has certainly been interesting. In just a few years, this novel compute orchestration technology, originated at Google, has taken the world by storm.

The innovation that Kubernetes introduced was that compute can be orchestrated to run anywhere, using virtualized clusters. This will give companies more options to decide how and where to execute compute, using the cheapest platforms. This brings new use cases in CCM. For example, innovative companies such as CAST AI are using data algorithms and monitoring of spot compute prices to determine the cheapest place to run compute at any time, using new attractive spot pricing models.

Cloud providers have always looked to lock in pricing for a minimum prescribed level of cloud usage, but spot pricing is likely to put more pressure on these margins as Kubernetes-driven compute is commoditized. Organizations will now be able to model their cloud growth and discovered discounted pricing to cover a substantial portion of their projected cloud needs over a contract term (usually up to three years, but occasionally longer for very large clients).

3. The Future of CCM: Management Approaches

We see an explosion of new CCM and FinOps tools coming to market. The tools we describe in this report as well as others are included at the end of this report. But beyond the technology, we need to discuss organizations and management. Technology tools are novel, but the question is how and where managers will use them.

As the cloud grows, organizations will have to better define and understand their cloud development plans. They will also need to defend these investments and costs to the board level.

As described above, the data shows that many companies are planning on accelerating cloud initiatives in 2023. At the same time, one in five respondents to our survey said that they are planning on slowing cloud adoption this year. Reasons for this can be manifold. As industrial Internet of Things (IoT) continues to take root across a variety of industries, and metaverse initiatives are being piloted in a number of Fortune 500 companies, the predicted demise of on-premises computing seems to have been somewhat exaggerated. Laws of physics notwithstanding, there are some applications that require computing power to literally be in the same room as the machines using it. At the same time, applications for edge compute and local business analytics argue for more on-premises infrastructure, not less.

Other variables suggest that cloud acceleration isn't a fait accompli for IT leaders. Type "why I'm abandoning the cloud" into your favorite search engine and you'll find plenty of recent (aka post-2020) articles as to why the cloud hasn't lived up to its promise. A common thread in these testimonials is that for some companies, cloud costs threaten to undermine the cloud value proposition, even when that value is fundamentally rooted in the indirect financial drivers of operational flexibility and agility outlined above.

In a nutshell, for companies to fully embrace cloud, better ways of managing costs are needed. If you ask any of the big cloud providers, they will all provide "tools" to help customers manage cloud spend. However, these tools amount to after-the-fact reporting on a cloud bill. These insights can be useful to understanding how cloud usage has occurred. But recall our discussion above; these insights are of little utility to the finance department after usage has occurred.

What's more, even with these insights, many companies are not organized in ways that make the information particularly useful. Although most finance and engineering leaders routinely meet quarterly, some even monthly, to review cloud costs, it's easy for these reviews to get bogged down vis-a-vis C-suite mandates to be agile, innovative, and responsive to shifting

market needs. Often, finance is seen as not understanding the needs of the business, while tech teams are accused of having a “devil may care” attitude toward sound financial practices if they end up standing in the way of meeting development milestones.

The answer: It’s time for formalized CCM.

The Need for Formalized CCM

To help business-led IT stakeholders to internalize the impact of their decisions on cloud costs, CCM needs to move beyond backward-looking measures of past cloud usage. Data on cloud costs needs to be made available in near real-time and shared in a manner that allows engineering teams to make cost optimization decisions before usage occurs. This need has given rise to a new breed of CCM technology suppliers.

Whereas the tools offered by large cloud providers provide static, backward-looking data, a new breed of vendors, such as Apptio, Aviatrix, CloudZero, Prosimo, Ternary, and Virtana, among dozens of others, are focusing on analyzing cloud data to help companies understand their cloud usage on an ongoing basis.

Some of the processes that might be driven by CCM include:

- Gathering data about cloud usage by specific applications
- Analyzing cloud use and assigning costs across business units
- Automating manual processes that hamper ongoing cloud resource management
- Automating cost arbitrage across compute, storage, or networking operations
- Providing network visibility to identify overprovisioned resources

These functions put the power to make cloud cost decisions into the hands of stakeholders that can impact cloud spend as it occurs, not after. However, as most companies know, simply throwing tech at a problem rarely yields a desired solution. That’s why effective CCM is as much about transparency, trust, and governance as it is about implementing tools that deliver insights.

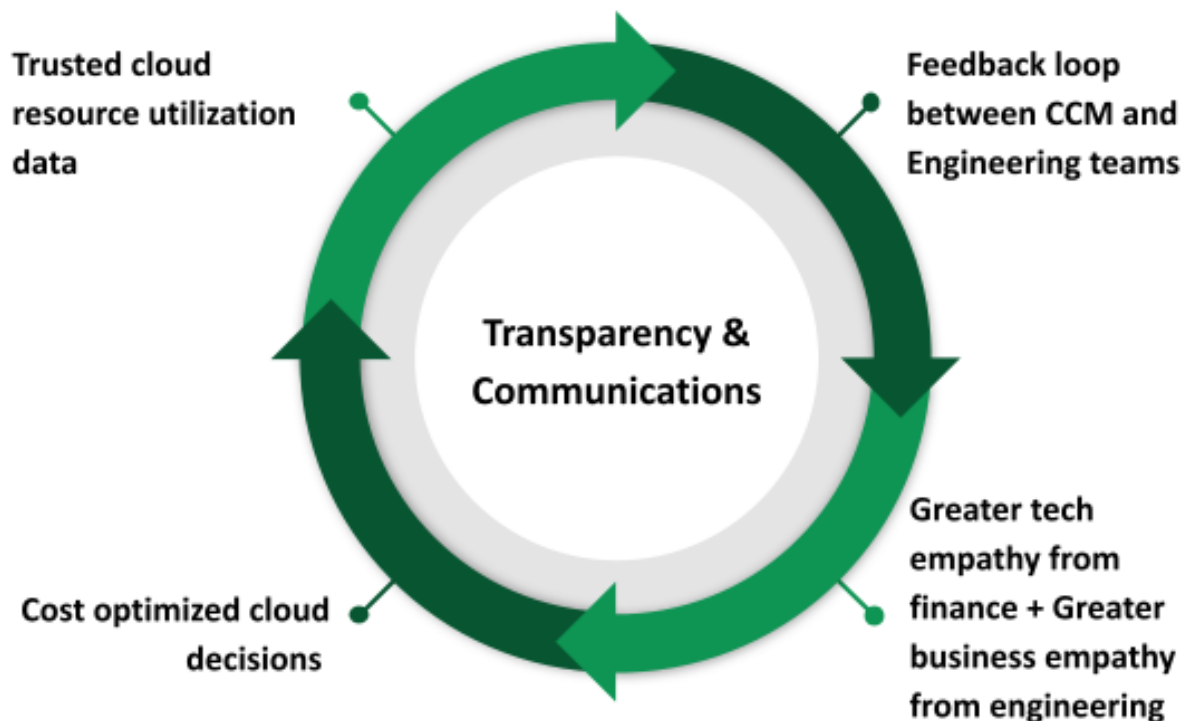
The Non-tech Reason Why Tech Can Fail

Time and again, technology implementations fail to meet expectations not because the tech doesn’t work, but because organizations are not equipped to use it properly. Increasingly, as cloud occupies more of a company’s compute and storage budget, many of the tried and true reasons for unmet expectations can be traced back to non-tech causes.

In the case of dissatisfaction over cloud costs, there are two main culprits. First off, finance

doesn't understand engineering's challenges. And second, engineering doesn't understand finance's mandates. In many companies, especially those that are in the midst of a multi-year cloud journey, it is a near certainty that engineering perpetually wants more resources at its disposal. More and more, business-led IT groups (which become increasingly decentralized and disconnected as the company grows larger) want to move more things to the cloud at differing paces in pursuit of different objectives.

However, to sign off on these requests, finance needs clear justification. Also, as is often the case, IT finance tends to be more centralized than business-led IT. So finance often has visibility into the "big picture" as it relates to tech acceleration funding, whereas individual tech teams housed in decentralized business groups do not. As a result, neither speaks the other's language.



In these cases, which are almost always present in any company of a certain size, using automated CCM tools that help monitor usage in real time is of little additional value compared to the static reporting offered by cloud suppliers. Yes, the data that these tools yield is useful, but without transparency and trust between different cloud stakeholders, tools can be doomed to underperform.

Before companies can truly take advantage of the benefits that automated CCM (aka FinOps) has to offer, more old-fashioned, low-tech building blocks are needed. These items include concepts such as stakeholder management, transparency, and trust. Indeed,

effective CCM starts with building relationships with coworkers. Helping engineers understand the impact of their decisions on cloud costs is the first step toward getting them to make more cost-conscious decisions. Likewise, helping finance understand the need for particular tools, features, and engineering decisions must be a reciprocal first step toward securing buy-in for innovation funding.



Building an Effective CCM Practice

Building relationships and creating trust is vital to executing an effective CCM strategy. Beyond that, however, work must be done to start realizing cost savings. The most common tactics in practice today use reserved and spot instances to hedge against price spikes caused by on-demand capacity to cover anticipated usage growth and/or spikes.

The natural tension in the market is evolving, as large public-cloud providers seek to lock in customers to long-term contracts, while customers look for more market-based and economical pricing. Techniques such as reserved spot compute instance result in steadily increasing minimum usage levels for customers. As such, to move CCM to the point where costs are being optimized, more sophisticated tools are necessary.

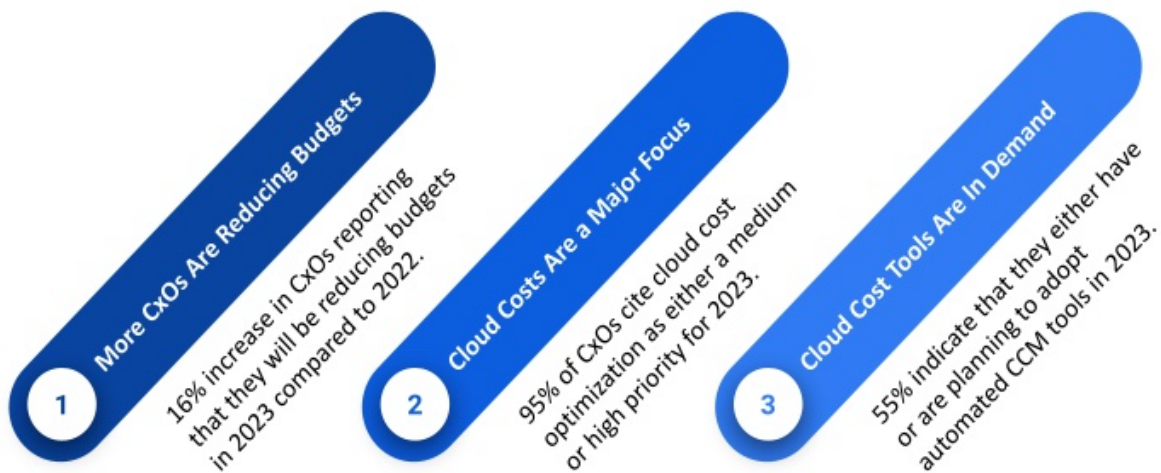
Companies can certainly plan for cloud growth and lock in discounted pricing to cover a substantial portion of their projected cloud needs in a large cloud contract, and spot instances allow a company to pre-pay for access to unutilized capacity to cover periodic spikes in usage that can occur during peak sales seasons, large dev projects, etc. We can, however, see a world in which most compute instance pricing becomes dynamic and market driven, rather than depending on contractual lock-in. As described earlier, tools from firms such as CAST AI or Yotascale will enable organizations to uncover cheap Kubernetes compute resources.

While automated tools that can help companies to move several levels beyond the somewhat rudimentary function of hedging cloud cost growth with reserved and spot instances, they require investments in both technology and human capital. To secure the executive support necessary to spin up a dedicated CCM practice, early CCM champions need to show positive results early and often. For this reason, starting by demonstrating the ability to use reserved and spot instances effectively is a great, and achievable, first step. In addition to using instruments that are readily available from cloud providers, it initiates the process of

establishing the communications channels, visibility, and trust between finance and engineering needed to make the implementation of more nuanced tools successful.

Automated CCM: Fighting Fire with Fire

Although effective CCM requires successful interpersonal communications skills by cloud stakeholders, there is little doubt that technology is needed to produce the insights that spur effective collaboration. To be clear, more effective collaboration is what's being demanded by C-suite executives. In a recent survey conducted by Battery Ventures, there is little doubt that company leaders see effective CCM as a key aspect of their 2023 financial strategies.



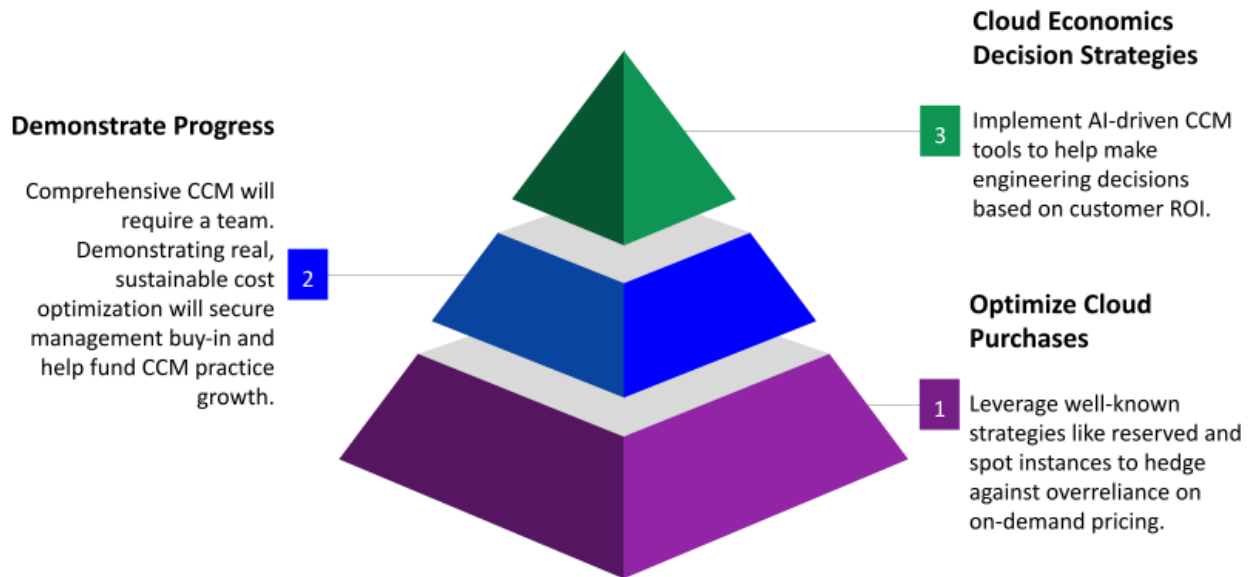
Source: Battery Ventures report

The Battery Ventures data shows increasing CxO concern over cloud costs. But another concern that is harder to quantify is the uneasiness that executives feel over the oligopolistic nature of the cloud service provider market. For all practical purposes, companies wanting to pursue any type of public cloud strategy are beholden to AWS, Google Cloud Platform, Microsoft, Oracle, and others. This form of vendor lock-in is unlikely to abate, especially in 2023, when economic worries have companies looking to consolidate vendors rather than diversify.

To this end, FinOps teams must have access to sophisticated tools that make better engineering decisions possible. Leveraging solutions from the companies listed in the Vendor Considerations section below helps reduce feedback loops from quarterly (monthly at best) exercises to weekly (daily when needed) strategy sessions that make cloud cost optimization a reality.

Providing engineering teams with more information allows them to adjust development decisions to optimize resources where possible. Perhaps more importantly, it enables cloud decisions based on objective measures rather than subjective arguments. Referring back to our discussion of managing complexity in large organizations, synchronizing the activities of different business units with different objectives is complex.

Oftentimes a particular business unit's strategy will include “moving processes to the cloud” as a strategic business objective. From a subjective point of view, it is difficult to prioritize one group’s move to the cloud over another’s. However, if the true cost of moving to the cloud (or expanding cloud operations) can be documented at a granular level across a number of cost dimensions, then it becomes possible to make objective decisions about which cloud projects are delivering the best ROI.



Now Hiring: Chief Cloud Economist

The next step beyond gaining granular insights and sharing them with individual teams to help influence their decision-making is to empower a single group or individual to assess the economic value of all cloud investments viewed in relation to each other. Here, the notion of a chief cloud economist is gaining favor in the FinOps world.



While few cloud economists are employed today at large companies, the persona for this role

would be a C-suite (or one level below CxO) that is designated to understand the cost implications of cloud operations at a granular level. These duties would include contributing to big-picture items such as C-suite cloud strategies and product strategies of the business units. It would also include more tactical duties such as understanding the tech requirements to support C-suite and business group strategies. This person would then provide input, if not outright decision-making, on cloud initiatives based on ROI characteristics of competing cloud projects.

The business implications are very appealing to company negotiators in IT procurement or finance that can approach cloud providers either for better pricing, more flexible contract terms, or for the ability to engage in creative strategic partnerships. We now have a path to the future of CCM, FinOps, and customers breaking the economic constraints of cloud provider lock-in.

4. CCM and FinOps Companies to Watch

It's still early in the CCM and FinOps revolution, but Futuriom has spent months research this space and has put together a list of the leading companies to watch in this space. As usual, this is not meant to be an exhaustive, but rather a list of the companies we have heard the most about (and its larger than a magic quadrant!).

Editor's notes: the companies featured in this list were picked by our analysts and companies cannot pay to be on the list. Sponsors' web links included.

Apptio

Founded in 2007 as a business process management company, Apptio acquired cloud cost management company Cloudability in 2019. Apptio offers solutions for technology business management (TBM), cost transparency, service costing, financial management, billing, budgeting, forecasting, and cloud cost management. Cloudability is focused on helping companies understand the TCO associated with running cloud services in AWS. This is accomplished primarily through making right-sizing recommendations related to cloud resource commitments and SaaS usage. In early 2023 the company acquired multi-cloud optimization specialist Cloudwiry, which focuses on helping companies to better manage commitments across multiple cloud suppliers. Apptio is a premier member of the FinOps Foundation and has raised more than \$250 million in funding.

Aviatrix

Trusted by more than 500 of the world's most innovative companies, Aviatrix empowers businesses to accelerate innovation, minimize downtime, and gain control of IT costs. Aviatrix delivers an enterprise-grade secure cloud network, backbone, and edge for mission-critical applications by creating a simplified and consistent networking architecture in and across cloud service providers. Combined with the Aviatrix Certified Engineer (ACE) Program, the industry's first and only multicloud networking certification, Aviatrix helps businesses to achieve their digital transformation goals. Aviatrix has raised a total of \$340 million in funding.

<https://aviatrix.com/>

CAST AI

Founded in 2019, CAST AI is a leading Kubernetes platform for automation, optimization, security, and cost management for AWS, GCP, and Azure customers. It continuously analyzes and optimizes cloud resources to find the optimal cost and performance match, achieving an average savings of 63%. CAST AI is application-centric, so it always starts by identifying application needs and picking the best combination of resources. It also lets users monitor costs in real-time, inspect them on historical cost reports, and instantly react to any anomalies. Connect your cluster, see suggested recommendations, and implement them automatically for immediate cost reduction. CAST AI has raised \$38 million in funding and is headquartered in Miami, FL.

<https://cast.ai/>

CloudZero

Founded in 2016, CloudZero seeks to differentiate itself by presenting its cloud optimization intelligence in terms of cost per hour of usage. According to the company, when engineers understand the cost of their cloud usage on a granular level, they can make smarter design decisions that balance performance and cost across multiple metrics including cost per customer, software cost of goods sold, and Kubernetes costs. CloudZero is a member of the FinOps Foundation and has raised \$15 million.

Flexera

Founded in 1988 as an IT asset management (ITAM) company, Flexera is a premier member of the FinOps foundation. The company's FinOps module integrates into the Flexera One platform, which can then be used as part of a comprehensive IT asset management strategy. Beyond cloud cost optimization, the company's other modules focus on SaaS license management, and cloud migration planning. Flexera has raised \$80 million in funding.

IBM (Turbonomic)

IBM acquired Turbonomic, an application and network resource management specialist, in 2021 along with Instana to power the company's IBM CloudPak for Watson product. The CloudPak suite is aimed at helping customers improve IT operations by using IBM's Watson AI engine to provide automated network insights. The product is built on Red Hat OpenShift to run across any hybrid cloud environment.

Kubecost

Founded in 2019, Kubecost is an open-source tool that built to give developers visibility into Kubernetes spend. Kubecost highlights four main pillars for its solution: cost allocation, unified cost monitoring, optimization insights and alerts and governance tools. As of 2023, the company is a member of the FinOps Foundation, and professes a deep commitment to building and supporting dedicated solutions for the open source community. In February 2022, the company raised a \$25 million Series A funding round.

Prosimo

Prosimo delivers a simplified multicloud infrastructure for distributed enterprise cloud journeys. Companies innovate faster and remain in control with the Prosimo integrated stack. This stack combines cloud networking, performance, security, observability, and cost management—all powered by data insights and machine learning models with autonomous cloud networking to reduce complexity and risk. Cloud-forward enterprises, including F100, have adopted Prosimo to successfully roll out revenue-generating applications, improve operational efficiency, and accelerate positive business outcomes.

www.prosimo.io

Snow Software

Founded in 1997 as an IT asset management (ITAM) solution supplier, Snow Software is headquartered in Stockholm, Sweden with a North America headquarters in Austin, TX. Since then, the company has added AI-driven SaaS license management and, most recently, in November 2022 introduced hybrid cloud management into its portfolio. Cloud cost management solution, Snow Atlas Platform, focuses on helping customers to manage Kubernetes costs as part of their cloud migration strategies. Reuters recently reported that the company generates annual revenue of about \$175 million. The Sumeru and Ontario Pension Board joined Vitruvian as shareholders in Snow Software in 2017 with a \$120 million investment.

Ternary

Founded in 2020, Ternary states that its mission is normalizing cloud spend data across AWS, Azure and GCP cloud environments. Ternary's approach seeks to ingest cloud usage data on an ongoing basis to provide near-real time insights that can be "normalized" for consumption by multiple cloud operations stakeholders in an enterprise including finance, engineering, IT and accounting. Ternary is among a new breed of companies that builds AI-driven decision engines into its product. As of 2023, Ternary is a premier member of the FinOps Foundation. In 2022, the company raised \$7 million in seed funding.

Virtana

Virtana was founded in 2008. Virtana Cloud Cost Management (CCM) provides ongoing cloud cost optimization with a unique focus on the balance between performance, risk, and cost. CCM gives cloud architects continuous bill analysis across AWS, Azure, and GCP that intelligently alerts on unexpected changes that drive cloud spend and provides a unified view of actionable saving recommendations. CCM's advanced 'What If' analysis engine empowers companies to manage performance and cost through smart policy-based rightsizing. CMM also gives companies per-instance visibility into programmatic discounts, data transfer fees, and instance utilization, providing a near real-time understanding of the true costs of their cloud environments. In January of 2022, Virtana raised \$73 million to accelerate its plan for AIOps and hybrid cloud management.

VMware (CloudHealth)

In 2018, VMware acquired CloudHealth for approximately \$500 million to help its customers better manage costs in AWS, Azure and GCP cloud environments. The company cites dozens of case studies with companies ranging from digital natives to Fortune 500 scale brick and mortar companies in the midst of comprehensive digital transformations. As of 2023, VMware is a premier member of the FinOps Foundation and CloudHealth is a FinOps platinum certified platform.

Yotascale

Founded in 2015 by Asim Yazzaq, former head of platform engineering at Paypal, Yotascale. Owing to the founder's experience at scaling cloud operations at Paypal, Yotascale claims as a core mission to provide cloud cost optimization solutions that can scale to operate in the world's largest environments. Yotascale has raised \$25 million through a Series B in 2020.

Zesty

Founded in 2019, Zesty was started to help companies overcome inefficiencies related to static cloud infrastructure by enabling the ability to automatically scale cloud resources such as storage, discount programs, CPU & RAM, to optimally match application demand. As of 2023, the company claims more than 100 customers and has raised more than \$110 million in funding. It is a member of the FinOps Forum.