Scaling Cloud FinOps

Proven Strategies to Accelerate Financial Success

Sasi Kanumuri · Matthew Zeier

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To Mom, Sujatha, my inspiration.
You taught me to dream big and strive with determination.
Everything I've achieved, I owe to you.
This book is for you.

~Sasi

To my father, Steven, to whom I am eternally grateful
for helping shape who I am today.
Had he stopped me from digging in the neighbor's trash, I'd have never found my first computer magazine, picked up BASIC programming, taken programming classes as a 4th grader, or found my way to Silicon Valley at the Internet's infancy.

~Matthew

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About the Authors

Sasi Kanumuri is a renowned cloud strategy and FinOps/cloud economics expert known for his innovative frameworks and diverse skill set. With a deep understanding of cloud architecture and expertise in cloud infrastructure, Sasi specializes in driving high efficiency and optimization across organizations. He has a proven track record of achieving substantial cost savings and leading successful cloud migrations.

Sasi's thought leadership in FinOps has left a lasting impact on the industry. He has led FinOps teams at large companies like Slack and Lacework and at UC Berkeley, shaping the future of cloud efficiency programs and guiding organizations toward significant cost reductions. His expertise in vendor management and deal strategy has resulted in advantageous agreements and solid, long-lasting partnerships.

As a pioneer in cloud economics, Sasi bridges the gap between finance, procurement, operations, and engineering, setting new standards for efficiency programs and redefining industry norms. He continues to be a sought-after leader in the field, committed to customer success and ongoing innovation, empowering organizations to optimize their cloud investments and drive sustainable growth.

Sasi Kanumuri's unique #Piggy-Bank Framework for cost governance is at the core of his approach. This innovative framework gives organizations insights and knowledge to promote cost awareness and meaningful conversations about cloud expenditure.

Additionally, Kanumuri has trained and mentored numerous individuals in the cloud sector. He has a passion for continuous learning and a commitment to professional education. He's led educational sessions, workshops, and internal meetups, sharing expertise and empowering engineering teams to flourish and succeed.

Matthew Zeier is a veteran of supporting and running at-scale production services across some of the largest high-tech companies, including Mozilla, Apple, VMware, and Lacework. Early in his career, he recognized that managing cloud spend should be part of engineering culture and has worked to advocate for efficient cloud usage across organizations.

As a former network engineer turned sysadmin turned SRE leader, Matthew can understand cloud usage and architecture across several discreet system components. Using customer happiness as his North Star, he focuses on platform reliability and efficiency as two foundational elements of a FinOps practice. As an engineering leader, Matthew has supported small and large teams (70+) while supporting infrastructure and services with 12x user growth. He has done this while being hyperaware of the economics behind those services.

As an automation fanatic, Matthew coined #BeachOps as a framing device for automation to build for the lazy rather than the busy and to ensure engineers focus on the important over the urgent.

About the Technical Reviewers

Otieno Ododa is a seasoned senior engineering leader specializing in site reliability engineering (SRE), DevOps, and infrastructure engineering in data centers and the cloud. Over his 20 years in Silicon Valley, his deep-rooted passion for engineering excellence has taken him to companies such as Twitch, Patreon, Zeta Global, and Opendoor, where he has built, nurtured, and scaled high-performing platform and infrastructure engineering teams, both domestically and internationally. Before leading teams, Otieno spent years as a site reliability engineer and cloud infrastructure engineer at various companies, including Friendster, Chomp, and Apple, managing data centers and large distributed systems.

Julie Herd has been a marketing leader for over 25 years, beginning in data storage and moving into cloud technologies. Julie is passionate about startups and has worked with pioneers in the cloud and storage industries, delivering innovative solutions built on the latest technologies. Her career has spanned hardware and software, product management, and product marketing, building and mentoring strong teams. Julie has led product and marketing teams at companies such as Harness, NetApp, and BlueArc (acquired by Hitachi Data Systems).

Julie has recently focused on building strong marketing teams that bridge the communication gap between what a product does and why a customer should care. She is a FinOps Certified Practitioner and is excited to continue her journey of helping build strong, scalable FinOps practices.

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To all of you—thank you for believing in me and this project.

—Sasi

Introduction

Imagine that you are building your dream home and have assumed the role of the general contractor. Your overriding concern is to stay within your allocated budget. Through meticulous planning, you have identified all the building materials required to build the house, purchased them upfront, and delivered them to the construction site. You are on-site daily, tracking every brick and board the subcontractors—analogous to organizational departments—pull from the stored materials. This scenario is analogous to the traditional on-premises IT model, where upfront costs are king, and all IT equipment, such as servers, storage devices, and Networking hardware, is purchased and managed in-house. This model often lacks flexibility, as any changes or additions require additional time, effort, and cost. Unlike cloud computing, which offers scalable and on-demand resources, the traditional on-premises model can be rigid and less adaptable to changing needs.

Now, picture building your dream house with a magic "cloud supply store." Instead of purchasing all the materials upfront, you grab what you need, pay as you go, and can easily adjust your plans as requirements change. In this model, subcontractors—analogous to organizational departments—pull materials from the cloud supply store as needed, representing decentralized procurement. Each department can independently manage its resources, scaling up or down based on real-time needs. This flexibility allows for more dynamic and responsive project management, similar to how cloud computing operates. However, with this great power and flexibility comes great responsibility. Without proper oversight and effective governance, costs can spiral out of control, leading to a potentially hefty bill. Therefore, it is crucial to implement strategies and tools to monitor and optimize cloud usage to reap the benefits while controlling expenses.

Before cloud computing became the de facto standard for new application development, applications were developed using on-premises hardware and software. IT costs were considered capital expenses, and centralized IT departments were responsible for procuring and providing compute, networking, and storage resources. All acquisitions were approved by the procurement department before purchase, which made the cost of goods sold (COGS) and R&D expense reporting relatively straightforward for the finance team.

However, with the advent of cloud computing, engineering teams can now access cloud-based compute, networking, and storage resources on demand, allowing them to provision and deprovision cloud resources quickly with a pay-as-you-go model. While this flexibility has greatly increased application development and deployment agility, it also has decentralized procurement outside traditional IT.

As a result, cloud spending has become fragmented, and cost accountability has suffered as finance departments need help understanding their cloud bills. This has increased the need for better cloud cost management (CCM) processes, with multiple organizations striving to create effective and efficient cost management processes.

As someone who has built Cloud FinOps practices from scratch at several large enterprises, I, Sasi Kanumuri, want to help organizations, regardless of their size, build world-class Cloud FinOps teams and avoid pitfalls that can hinder their Cloud FinOps journey. While building and scaling lean FinOps teams, I created a blueprint and road map, the 6-Factor FinOps Formula (presented in Chapter 1), to navigate the complex world of Cloud FinOps. The 6-Factor FinOps Formula expands on the FinOps Framework, developed by the FinOps Foundation, moving beyond theory into practical application.

This book is your one-stop shop for navigating the world of Cloud FinOps, regardless of your role in the cloud ecosystem. This guide will equip you with the knowledge and tools to achieve sustainable cost efficiency in the cloud era, whether you are in any of the following roles:

- Finance professional roles:
  - Financial analysts
  - Finance managers
  - Business partners
- Technical and tech-adjacent roles:
  - Cloud architects and solutions architects
  - Enterprise architects
  - Cloud engineers, platform engineers, and site reliability engineers (SREs)
  - Software engineers

    - Technical program managers (TPMs)
- **Executive and leadership role:**
    - Engineering managers
    - Directors/VPs of engineering/finance
    - CTOs, CIOs, COOs, CFOs (CXOs)
    - Other executives who drive cloud initiatives

This book will help you to navigate the cloud's financial landscape and will introduce you to FinOps. It will equip you with the knowledge and tools to leverage the cloud's agility while controlling your costs, preventing your dream house from becoming a financial nightmare. This book will delve deep into the 6-Factor FinOps Formula concepts, providing practical insights, case studies, and actionable strategies to build and scale FinOps practices from the ground up. It also includes a comprehensive framework, the #Piggy-Bank Framework (in Chapter 5), for creating a culture of cloud cost awareness across engineering, finance, and management teams. Throughout the book, you'll embrace the power of Cloud FinOps and unlock the full potential of your cloud investments, maximizing business value for every dollar spent.

CHAPTER 1

Cloud FinOps

The preceding Introduction presented the hypothetical cloud supply store for obtaining materials to build your dream house. Such a store would offer incredible flexibility, however keeping track of all the resources being pulled from the store by subcontractors on an as-needed basis would be overwhelming. You would want your dream home to be a manageable financial burden, right?

This chapter delves into the world of FinOps, your construction project manager for the cloud. Just as a project manager ensures your house is built efficiently and within budget, FinOps helps you navigate the financial aspects of your cloud journey.

In today's rapidly evolving digital landscape, businesses rely on cloud technologies to drive innovation, agility, and scalability. Cloud services offer enhanced scalability, flexibility, and cost-effectiveness compared to traditional on-premises architecture. As organizations embrace the cloud to unlock its vast potential, they encounter a crucial challenge: managing the costs associated with these robust cloud services.

Cloud FinOps is an emerging discipline that seeks to solve the challenge of cloud cost management by creating a set of practices and principles to optimize costs while maintaining operational excellence. This chapter will explore the definition and basic tenets of Cloud FinOps to provide the foundation for the strategies and best practices for building and scaling FinOps covered in the rest of the book.

This chapter lays the foundation for understanding FinOps and why it matters. So get ready to master the financial aspects of your cloud journey and build a cost-effective and sustainable dream house...in the cloud, of course!

Cloud FinOps Defined

In the context of cloud cost management (CCM), the FinOps Foundation defines Cloud FinOps as a portmanteau of "Finance" and "DevOps," representing the intersection of finance, procurement, DevOps (that is, combining development and operations to

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increase the efficiency, speed, and security of software development and delivery), and engineering to provide a comprehensive framework for efficient cloud cost management.

While the FinOps Foundation offers a comprehensive definition, here's my take on what FinOps truly encompasses: Cloud FinOps is the practice of maximizing business value for every dollar spent in the cloud and cultivating a culture of cost awareness, accountability, and strong collaboration between finance, procurement, and engineering.

The Cloud FinOps methodology gives teams the framework to establish accountability, visibility, and control over cloud costs. Cloud FinOps is a liaison between finance and engineering teams, enabling them to collaborate effectively on cloud resource spending throughout an application's or project's lifecycle. This includes cultivating a culture of cloud cost awareness, establishing cloud usage policies, and leveraging the right tools to maximize cloud resource usage.

By leveraging people, processes, and technology, Cloud FinOps enables organizations to manage cloud costs effectively, allowing them to visualize costs better and make informed decisions to optimize cloud investments.

In some organizations, Cloud FinOps is also referred to as *Cloud Economics*, and the two terms can be used interchangeably when referring to the practice of ensuring strong financial management of cloud computing resources.

We'll also be using the shortened version "FinOps" interchangeably with "Cloud FinOps" throughout the rest of the book, so make sure that you do not confuse "FinOps" with its alternate meaning of "financial operations," a broader term that encompasses all aspects of managing an organization's finances.

A Glimpse into the Pre-FinOps Era: Traditional Cloud Operations Model

According to the Flexera 2024 State of the Cloud Report, an average of 30% of cloud spend often ends up as waste or idle resources? Almost anyone developing software in the cloud has at least one cautionary tale about out-of-control cloud costs, usually because they didn't see a cost spike as it happened or missed a savings contract expiring. Unused or underutilized resources such as idle instances, dormant storage, or poorly configured services can lead to significant ongoing expenses.

This warrants the need for cloud cost visibility that allows businesses to manage their cloud resources and costs effectively while maintaining optimal performance and security standards. Without cloud visibility, cloud costs often remain uncovered and drain the budget.

Running a business without clear visibility into its costs dramatically limits its decision-making ability. Organizations can make educated decisions regarding resource provisioning, choosing the right pricing models, or identifying cost optimization opportunities only if they fully grasp the costs of various cloud services. Clear cloud visibility can help ensure effective decisions, seized opportunities to optimize costs, and efficient use of cloud resources.

Financial Impacts

We can't overstate this fact enough: a lack of cloud cost visibility directly impacts your bottom line. Multiple experts and research studies state that, on average, 30% of cloud spend is wasted *for any organization*. Every dollar wasted could be better utilized in your cloud to accelerate your business growth. Potential financial impacts from a lack of cloud cost visibility include the following:

- *Overspending and budget overruns*: Cost visibility is necessary for efficient financial planning and budgeting. Operating with limited or no visibility into cloud costs increases the risk of running over budget and spending more than initially planned. If finance teams need proper visibility into cloud computing costs, allocating the right amount of funds among the many departments and projects becomes a monumental task. Unless finance teams dedicate full time to reporting cloud spend, organizations spend beyond their cloud budget and need help managing overall spending.
- *Incapability to make predictions or plans*: Understanding costs is necessary for short-term and long-term financial planning. It's easier for businesses to make accurate future spending projections if they comprehensively understand past data and patterns relating to costs and spending. A lack of cloud cost visibility can make it challenging to effectively budget and manage finances, making it harder to adequately allocate resources, anticipate cost variations, and adjust to changing business needs.

- *Obscure financial reporting*: Cost visibility is vital for meeting financial reporting and compliance criteria. Finance teams require accurate and auditable cost data to report cloud expenses, allocate costs to departments, and ensure compliance with regulatory norms. Providing transparent and accurate financial reports is only possible with apparent awareness of costs, and businesses risk encountering problems during audits and regulatory assessments.
- *Lost prospects for improvement and cost optimization*: Clear visibility into costs lets you keep tabs on your spending and spot areas where you may save money and improve efficiency. For procurement teams, this visibility directly impacts cloud contract purchasing strategies. With visibility into forecasted cloud spend, procurement teams can take advantage of potential cost-saving initiatives, such as strategically using savings plans, negotiating corporate enterprise license agreements, or purchasing the right type and quantity of reserved instances. A lack of cloud cost visibility can result in lost opportunities to cut expenses and optimize cloud computing investments.

Technological Impacts

Operating without cost visibility in cloud computing has repercussions that transcend financial implications, affecting your engineering teams and overall technological development. Engineering teams play an essential role in managing cloud spending as they focus on their primary charter of creating innovations for the organization. Potential technological impacts from a lack of cloud cost visibility include the following:

- *Poor utilization of available resources*: Engineers need visibility into cloud costs and performance to make informed decisions about provisioning the right types and amounts of cloud resources for their application workloads. Facing a trade-off between overprovisioning resources for guaranteed performance and underprovisioning resources to save costs, engineers prioritize customer experience, potentially incurring higher expenses. Moreover, without insights into cloud costs and performance, development teams often use

excessive resources or select overly expensive solutions. Unaware of the financial implications, they may unknowingly contribute to overprovisioned resources or miss opportunities for consolidation and optimization. This results in inefficient resource allocation, higher costs, and missed opportunities for savings.

- *The application's layout and optimization*: Cost visibility is essential in directing engineers to create cost-efficient application architectures. Cloud architects risk mistakenly developing cloud resource-intensive and costly solutions because they often lack knowledge of the financial consequences of the many architectural choices available to them. Engineers can discover opportunities for cost optimization, use efficient approaches to resource utilization, and design scalable and cost-effective solutions when they have visibility into the costs involved.
- *Systems performance monitoring*: Engineers require visibility into how resources are utilized and the expenses associated with those uses, whether they are troubleshooting performance issues or optimizing application performance. Poor visibility of cloud resource performance can cause bottlenecks, suboptimal performance, inefficient resource allocation, more downtime, higher costs, and lower customer satisfaction. Proper visibility is crucial for efficient resource utilization.

Organizational Impacts

Lack of cloud cost visibility can have broader impacts on the people and processes of your business. Still, these impacts can often be overlooked because they don't directly affect the bottom line. Potential organizational impacts from a lack of cloud cost visibility include the following

- *Priorities that are not properly aligned*: Various teams can have contradictory priorities regarding cloud resources if they do not have visibility into the costs involved. For instance, engineering teams may prioritize performance and functionality more without considering the associated expenses. In contrast, finance teams may

place a higher priority on cost control and budget compliance. This imbalance can lead to friction and difficulty when attempting to balance satisfying corporate objectives and optimizing costs.

- *Lack of collaboration*: Increased cost transparency fosters collaboration between engineering and finance teams. When both groups have access to the same cost data, they can better collaborate to maximize the use of available resources. They can spot opportunities to cut costs and arrive at well-informed judgments that balance functionality, performance, and cost-effectiveness. Running a business without clear visibility into its expenses might make collaborating more challenging and lead to categorized decision-making.
- *Potential for layoffs*: In extreme cases, organizations experiencing financial strain due to uncontrolled cloud spending may resort to layoffs as a cost-cutting measure. This action can negatively impact morale, productivity, and employee trust. Implementing clear cloud cost visibility solutions can help organizations optimize their cloud environment and avoid unnecessary layoffs, allowing them to focus on growth and innovation.
- *Abdication of personal responsibility*: Cost exposure encourages accountability for employees inside the firm. Linking expenses to specific departments, teams, or projects is challenging when cloud spending is invisible. This lack of accountability can lead to disengagement and hamper efforts to encourage responsible resource usage and cost-conscious behavior.

Organizations should prioritize implementing effective cloud cost management procedures and tools to reduce the repercussions of needing more visibility into cloud costs. This involves using native cost management tools supplied by cloud service providers (CSPs), utilizing cost optimization solutions provided by third parties, building transparent governance frameworks, putting chargeback or show-back mechanisms in place, and routinely evaluating cost data to identify cost optimization opportunities. Organizations that embrace cloud cost visibility can reduce their exposure to financial risks, improve resource allocation, improve their ability to make educated decisions, and more effectively manage their costs.

Why Focus on FinOps?

Creating a new FinOps practice in your organization can seem daunting, especially when considering the competing priorities for investments in time and effort of the people needed for a FinOps practice. Just as the switch from on-premises to cloud computing was driven by the need to ensure long-term business growth and agility, implementing FinOps is a strategic investment in your business to reap long-term gains.

Cloud computing provides elasticity and scalability and bypasses traditional procurement processes to procure cloud infrastructure resources, enabling businesses to adapt quickly to shifting customer requirements. FinOps helps to maximize this flexibility by creating a transparent accountability system for cloud spending across engineers and business units. It allows companies to monitor, allocate, and attribute costs granularly to specific projects or applications and stakeholders, developing a culture of fiscal responsibility. FinOps makes it possible to make informed decisions.

The FinOps methodology encourages collaboration between finance, operations, procurement, and engineering departments. The goal is to foster a *culture of cost awareness* and drive cost efficiency, breaking down silos and encouraging collaboration between different functional areas. When teams become more cost aware of their cloud infrastructure, they can use this knowledge to make data-driven decisions to maximize cost savings. This cultural shift can lead to significant cost savings through cost-conscious architectural choices and improved cloud cost efficiency.

FinOps provides the guardrails needed to help businesses optimize their cloud costs by offering insights into resource spend, efficiency and govnernance frameworks at scale. The FinOps frameworks assist in identifying opportunities for cost savings and promoting strategies that can help reduce waste. Organizations can make the most of their investments in the cloud by ensuring their costs align with the business benefit.

Implementing FinOps governance policies and frameworks promotes long-term cloud resource efficiency by implementing rules that govern resource utilization and rightsizing, cloud security, and compliance. The cloud governance procedures developed by the FinOps teams ensure effective risk management in cloud environments.

FinOps is critical in driving cost optimization plans by fostering cost awareness and opportunities for collaboration and oversight. By employing a FinOps approach, a business can efficiently manage and optimize cloud costs, harness data-driven insights

for cost optimization, and develop a culture of cost consciousness. The cross-functional collaboration and continuous improvement hallmarks of the FinOps methodology allow businesses to realize the greatest possible return on their cloud investments and conduct cloud operations cost-effectively.

Vision, Mission, and Charter of FinOps Teams

The goal of implementing FinOps is to bring together the technology, operations, and finance teams to manage costs and improve overall efficacy. Achieving cost efficiency and fostering a culture of cost awareness while maintaining or improving the performance and functionality of cloud-based systems should be the primary focus of a FinOps team.

The combined team will need extensive knowledge of CSP pricing methods, resource allocation, and usage patterns to accomplish this. The team analyzes consumption data, identifies cost drivers and cost optimization opportunities, and implements procedures to maximize efficiency while collaborating closely with engineering and operational departments.

The Vision

The *vision* of FinOps teams is to revolutionize how enterprises manage and use cloud resources by incorporating financial accountability into the cloud operating model.

The goal is to establish a culture where everyone involved, from developers to executives, knows the cost implications of their actions. They should collaborate to find ways to minimize costs as much as possible. The vision involves building a framework that allows enterprises to make data-driven decisions, maximize resource allocation, and use cloud computing most cost-effectively while retaining their agility and innovative spirit.

The Mission

The *mission* of FinOps teams is to enhance organizations' CCM capabilities by utilizing procedural frameworks and strategies to maximize business value from efficient cloud and Software as a Service (SaaS) resource usage.

FinOps teams' primary focus is to equip technical and nontechnical staff with the techniques, procedures, and tools to monitor, report, and analyze their cloud expenses. These techniques enable organizations to make informed decisions and accelerate cloud financial success.

The Charter

The FinOps team *charter* within an organization is a set of guiding principles, objectives, and obligations for implementing and practicing FinOps. While the exact charter for an organization should be tailored to its specific requirements, FinOps charters include the following elements:

- *Cost transparency and cost responsibility*: FinOps establishes cost visibility and responsibility within an organization, which is crucial for financial success. FinOps teams create effective cost-monitoring methods that give stakeholders clear insights into cloud costs. By understanding the economic consequences of cloud resource utilization, stakeholders become accountable for their costs and take ownership of their decisions. This culture of cost awareness encourages teams to optimize cloud usage and minimize costs. In short, FinOps is essential for effective cost management and cloud financial success.
- *Collaboration and cross-functional alignment*: Finance, operations, and engineering teams benefit from increased collaboration and cross-functional alignment when implementing FinOps. This allows for more effective communication and a more profound comprehension of cost issues, bridging the gap between technical and financial viewpoints. Facilitating collaboration and ensuring that cost optimization strategies are established and implemented cooperatively with input from all key stakeholders is one of the primary responsibilities of FinOps teams, and it is accomplished through regular meetings, discussions, and shared goals.

- *Strategies and frameworks for cost-effectiveness*: FinOps offers strategies and frameworks to formulate cost governance and optimization plans. It establishes procedures and rules for allocating, using, and rightsizing available resources. FinOps teams work closely with engineering and operations teams to pinpoint areas of cost inefficiency and wasted spending. Using data-driven insights and cost analysis enables FinOps teams to identify and implement cost-cutting initiatives that reduce considerable expenses. These tactics may include rightsizing instances, optimizing storage, or using reserved or savings plans.
- *Continuous improvement and optimization*: The FinOps methodology encourages a culture of continual improvement and optimization. FinOps teams can discover opportunities for optimization and take proactive measures to drive cost efficiency thanks to their vigilant monitoring and analysis of cloud costs. They continually examine the success of cost optimization measures, assess cost trends, analyze the factors contributing to costs, and so on. This iterative strategy allows enterprises to hone their cost optimization efforts and ensure that they align with the shifting requirements of their businesses and advances in technology.
- *Cost governance*: FinOps is a critical component of formulating and enforcing cost governance regulations. FinOps teams ensure that suitable policies and controls are in place to oversee costs by collaborating closely with finance and compliance teams. FinOps teams establish budget thresholds, construct approval processes, and implement methods to track and allocate expenditures effectively. FinOps teams ensure that cloud resources are provided and utilized in line with business policies, compliance standards, and cost optimization goals. In this role, they serve as gatekeepers.
- *Team education and empowerment*: FinOps teams are responsible for educating and empowering teams throughout the enterprise so that they can make informed decisions about cost optimization. They offer training, direction, and recommendations for best practices to teams involved in providing and utilizing cloud resources. FinOps