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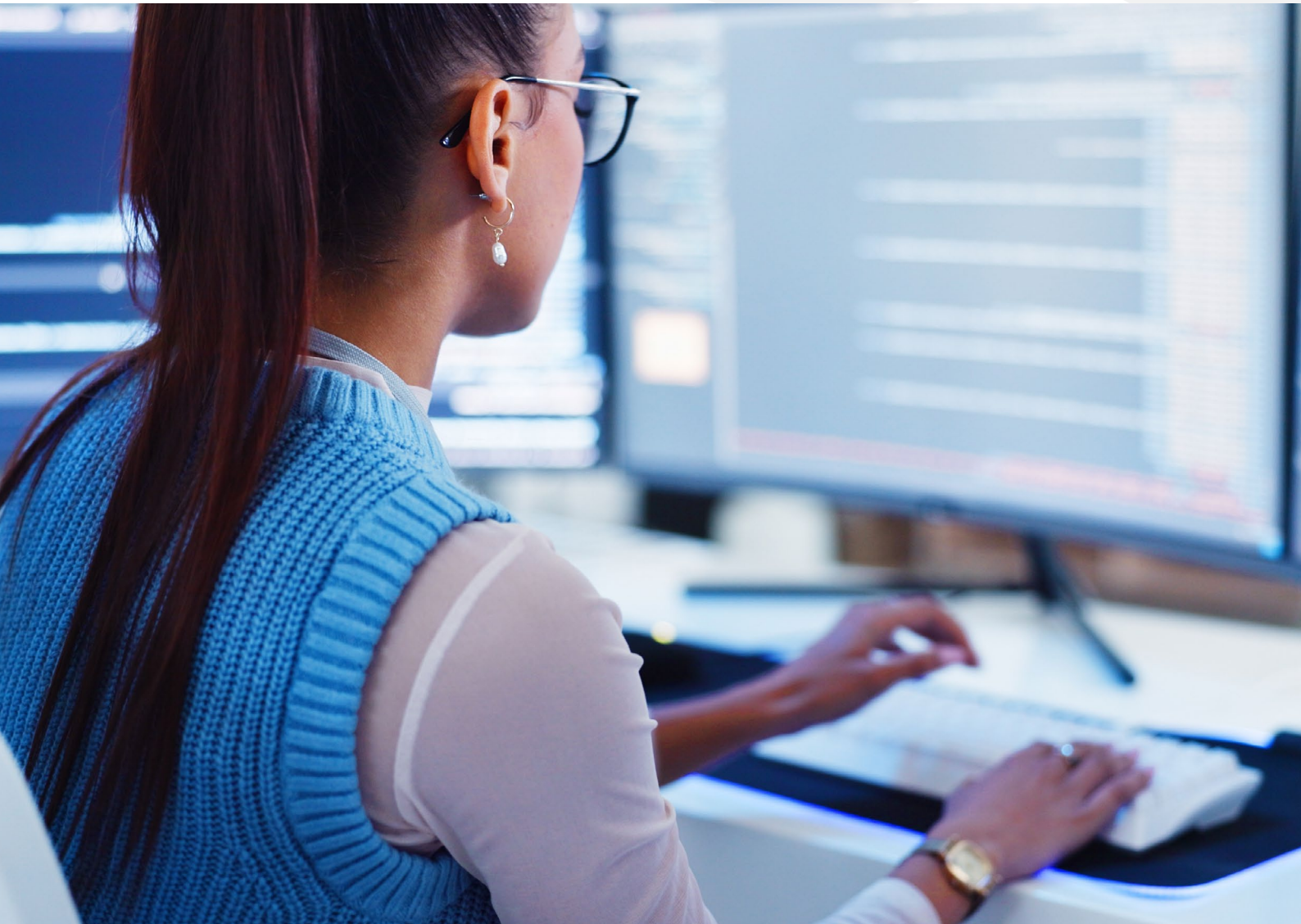
WHITE PAPER

Fighting cost complexity with FinOps

The modern approaches and implementations that most enterprises need to employ



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Executive summary

Today's abundance of choices that cloud computing introduces, the relatively low cost of entry, and the focus on technology as a force multiplier of business innovation combine to drive the rising numbers of systems within enterprises. These factors naturally lead to complexity that causes cost governance and cost efficiency challenges. This results in a need to refocus on the management of IT resource spending and implement new approaches, such as financial operations (FinOps) and other emerging tools, to put controls and observability on cloud and non-cloud costs.

The growth of cloud and non-cloud IT resource usage and the rising heterogeneity of these resources naturally create complexity. However, the primary cause of complexity is the proliferation of multicloud deployments. A vast majority of large organizations already deploy multicloud architectures. What's more, their data is distributed across several cloud providers. Companies leverage whatever best-of-breed cloud service they need to select whatever technology is required to create innovative value for the business. This leads to a rise in the number of cloud services under management.

The rise of multicloud created these key challenges:

Increased cost complexity

With multiple public cloud providers in the mix, all with different terms, prices, and billing models for each service, the ability to track and manage cloud computing costs grew well beyond the scope of most IT budgets and billing tools.

Inability to define the value to stakeholders

As previously discussed, operating a complex mix of platforms and services that include cloud cost management comes with operational challenges. The complexity makes it difficult to carry out cost observability, and the value metrics or key performance indicators (KPIs) require ongoing monitoring, including direct business value and cost/unit economics. The challenge is to track the value being returned to the business, allowing adjustments to be made during the lifecycles of the applications and data sets.

A vast majority of large organizations already deploy multicloud architectures. What's more, their data is distributed across several cloud providers.

Unreliable cloud cost planning

It's hard to understand what a cloud deployment will cost when teams don't know how to do adequate cost planning to support budgeting decisions. Today's challenge is to understand the current state of the multicloud or cloud deployments as they relate to resources leveraged and costs incurred.

Asset/Software management

The need for effective cloud financial operations (FinOps) becomes increasingly critical as organizations continue to rely on cloud computing to support their operations. Many organizations must adopt a holistic approach to cloud infrastructure deployments to bridge the gap between cloud FinOps and traditional asset/software management practices.

This paper is a guide for IT leaders who are hitting a "complexity wall" caused by technology operations complexity and the complexity around tracking costs, asset management, audit management, and demand planning. Many disciplines, processes, and tools are needed to optimize the value returned to business for cloud and non-cloud deployments. Indeed, if you're in an enterprise that leverages a complex cloud deployment, you're likely reading this paper to find a solution to the cloud cost complexity dilemma.

Core points and conclusions of this paper and the subsequent call to action include:

- The current approach to cost management for complex cloud deployments does not work for most enterprises. Millions of dollars are lost each year.

Many disciplines, processes, and tools are needed to optimize the value returned to business for cloud and non-cloud deployments. Indeed, if you're in an enterprise that leverages a complex cloud deployment, you're likely reading this paper to find a solution to the cloud cost complexity dilemma.

- As best practices and approaches continue to evolve, finding the right path is a challenge for most businesses.
- FinOps requires a culture change to become effective. This includes new processes, disciplines, and net-new accountability.
- Cloud cost observability is critical for successful cloud cost complexity management. We must see the cost and determine its ongoing meaning. This is an essential FinOps capability for complex cloud deployments.
- Asset management becomes a critical practice that most enterprises lack today, and the added complexity of today's modern cloud deployment makes asset management more daunting.
- Cross-cloud FinOps requires a new layer of tooling that many enterprises don't yet understand. This moves from cloud-native accounting tools specific to a single cloud provider to cross-cloud cost observability, governance, and tracking that removes much of the complexity from these deployments.
- The rising interest in sustainability, including ESG requirements, leads most enterprises to FinOps systems that can produce compliance and audit reports around carbon output and savings through the more efficient use of these resources.
- Our need to rethink how FinOps works, how it's applied, and what tools are most valuable to make FinOps work for complex cloud deployments.

Current FinOps best practices and approaches: What works, what doesn't

The FinOps best practices currently leveraged by most enterprises include:

1. Establishing a FinOps team and create a FinOps program.
2. Tagging resources appropriately to ensure accurate cost allocation and cost tracking.
3. Continuously optimizing cloud infrastructure costs by regularly reviewing usage patterns and identifying areas to optimize costs.
4. Selecting the right size and type of workload resources to avoid overprovisioning or overspending.
5. Regularly monitoring cloud usage and control costs by setting up cost limits, alerts, and notifications.
6. Using cloud-native FinOps tools, such as AWS Cost Explorer, Google Cloud Billing, and Azure Cost Management, which can analyze and manage your cloud usage and costs.
7. Educating the team about FinOps best practices.
8. Automating processes such as tagging and cost optimization.
9. Collaborating with stakeholders, such as developers, operations, finance, and business teams.
10. Establishing a common data set that runs across all the cloud providers and even non-cloud systems.

While some of these best practices are productive, some need to be updated due to the rising complexity of cloud, multicloud, and other complex cloud deployments. Indeed, many existing best practices fail to provide enterprises with the processes and practices they need to streamline FinOps and provide a better path to near 100 percent cost efficiency for cloud computing.

Let's examine the typical deficiencies that contribute to cloud cost complexity and how to fix them.

Raw cloud cost data monitoring and rudimentary analysis

Raw cost data monitoring, as related to cloud FinOps, refers to tracking and analyzing data related to cloud usage and costs (see Figure 1). This includes monitoring raw data related to infrastructure usage, application performance, and cost data. The goal of raw cloud cost data monitoring is to identify trends, patterns, and anomalies in cloud usage and costs so that action can be taken to optimize operations and reduce costs.

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This is a tactical approach to cloud cost data monitoring and FinOps in general, in that we observe the raw data with abstractions (such as totals and averages) that may have some tactical meaning. However, this data is largely useless to those who drive FinOps because there are few or no valuable insights into what this data means, nor the ability to automate cost optimization procedures from this raw cost data.

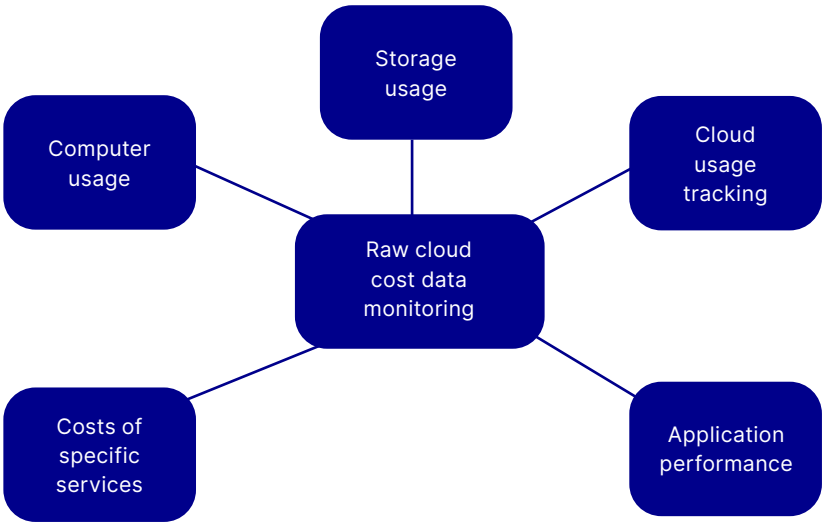

Figure 1. While raw cloud cost data monitoring is a standard best practice, it does not provide the value enterprises need from a FinOps program and tooling. More comprehensive insights are required, thus the emerging concept of FinOps observability (see Figure 2).

FinOps observability is a more comprehensive approach to monitor and analyze data across the entire application stack, from the infrastructure to the application layer.

FinOps observability is a more comprehensive approach to monitor and analyze data across the entire application stack, from the infrastructure to the application layer ***(see Figure 2)***. This includes monitoring data related to infrastructure, application performance, user behavior, and business metrics. FinOps observability aims to understand how the application performs and affects cloud usage and costs. This is a much better approach to find valuable insights from raw data.

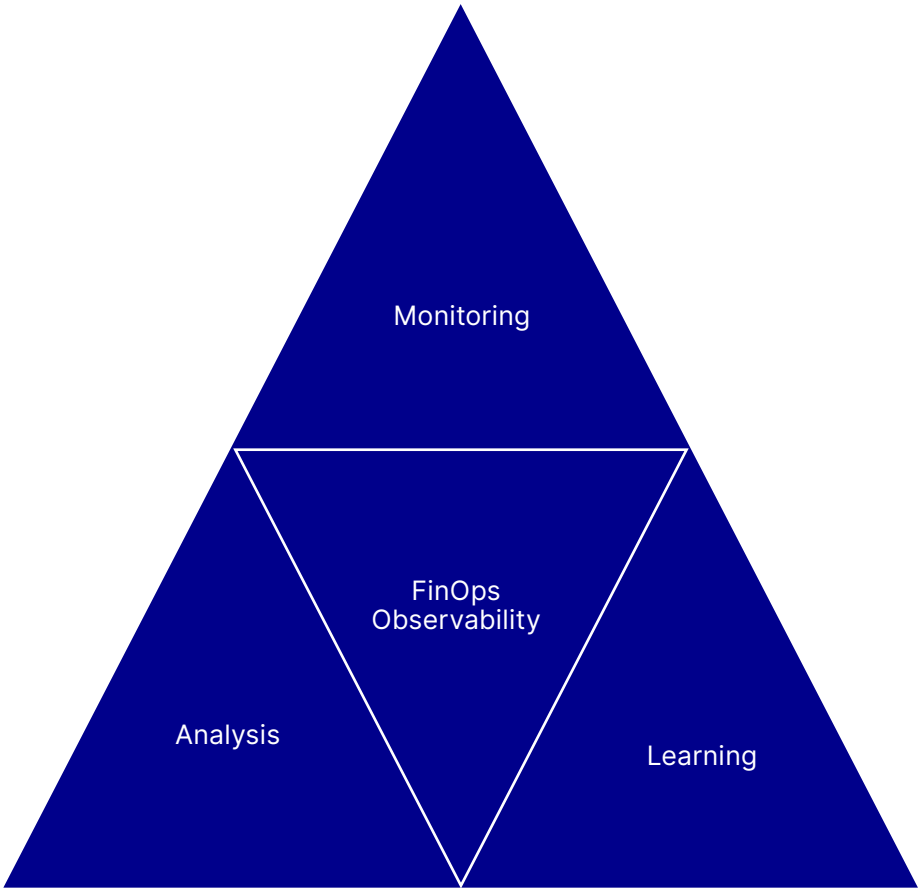

Figure 2. FinOps observability provides critical insights into what the data means and can drive core capabilities such as cost optimization and planning to support enterprise cloud operations strategically.

While raw data monitoring and FinOps observability both involve tracking and analyzing cloud cost data. The critical difference is the level of visibility and insight provided. Raw cloud cost data monitoring offers insights into cloud usage and costs. FinOps observability provides a more holistic view of the entire application stack which enables organizations to optimize cloud usage, reduce costs, and improve their overall performance and reliability. As discussed earlier, this is a much more valuable and effective weapon to deal with overly complex cloud costs.

You get from raw data to FinOps observability through the analysis of the raw data to determine actual meaning. For instance, we understand how much a cloud storage system costs for GB of usage, and for a specific amount of time.

The overall idea is to track what the data actually means, not just raw values that only tell a small portion of the FinOps story.

Observability would add other dimensions to the data, including other raw data, and thus increase the level of insights. Such as looking at the ongoing cost of a cloud storage system, as related to application usage, as related to the value of that application to the business, as related to overall productivity of systems attached to that cloud storage instance. While observability, in terms of finding meaning in raw data is much more complex to establish, the overall idea is to track what the data actually means, not just raw values that only tell a small portion of the FinOps story.

Links to asset management

Asset management and FinOps are increasingly linked together in modern IT organizations to provide several vital services needed to deal with complex cloud deployments. Solid links to asset management are concepts that must be added to many enterprise FinOps programs and tooling. These include:

Asset inventory services to maintain an inventory of all IT assets within an organization. In the context of FinOps, having an accurate inventory of assets is critical to effective cloud cost management. This includes understanding the type, size, and utilization of cloud resources.

Asset tagging to apply metadata to IT assets to enable better tracking and management. In the context of FinOps, tagging cloud resources is essential to allocate costs accurately to different departments, teams, or projects.

Asset lifecycle management services to manage the lifecycle of IT assets, from acquisition to disposal. In the context of FinOps, this includes managing the lifecycle of cloud resources by identifying unused resources and deleting them to reduce costs.

Asset optimization to optimize the use of IT asses to reduce costs and improve efficiency. In the context of FinOps, optimizing cloud resources can significantly reduce cloud costs and improve the overall cost efficiency of IT operations.

Asset governance to implement policies and procedures to manage IT assets effectively. In the context of FinOps, asset governance can help ensure that cloud usage and costs are aligned with business objectives and budgets.

A successful FinOps program requires effective asset management. By maintaining an accurate inventory of IT assets, optimizing asset utilization, and implementing effective asset governance, organizations can reduce cloud costs, improve IT efficiency, and drive better business outcomes.

Siloed FinOps

Of all the concepts discussed here, using cloud-native FinOps tools is a common but costly mistake many enterprises make when deploying FinOps programs and tooling. If we use FinOps tools that only work for a single cloud provider, then we move to multiple providers; we'll need a FinOps tool or sometimes tools for each cloud services provider (CSP). Let's discuss why this approach has fundamental limitations.

When running cloud-native FinOps tools within each cloud provider, you create a silo that limits cost optimization, cross cloud visibility of costs, and more.

First, we focus on a single cloud provider. This limitation is obvious when dealing with multiple CSPs, we'll have a different native tool for each. This leads to additional complexity because we need the skills and processes required for each FinOps CSP solution. Second, we focus on siloed cloud cost optimization. Again, if we use FinOps tools native to each specific CSP, we can only optimize costs within that CSP's silo. While we can deal with cost optimization, including managing dependencies intra-cloud, we cannot understand and optimize cloud services in other clouds that may be coupled to services in and between clouds.

Let's say we have an AI system running in CSP A that learns from a data feed from CSP B. It operates in a silo (see Figure 3) because each service is managed using a FinOps tool running on each CSP. That tool needs more visibility into systems, applications, and services external to that single CSP.

Thus, we have no visibility into dependencies that need to be optimized, such as only running the AI system on CSP A when data flows from CSP B and not sending data from cloud to cloud when the AI system is down for maintenance—simple things that need cross-cloud visibility with siloed FinOps solutions.

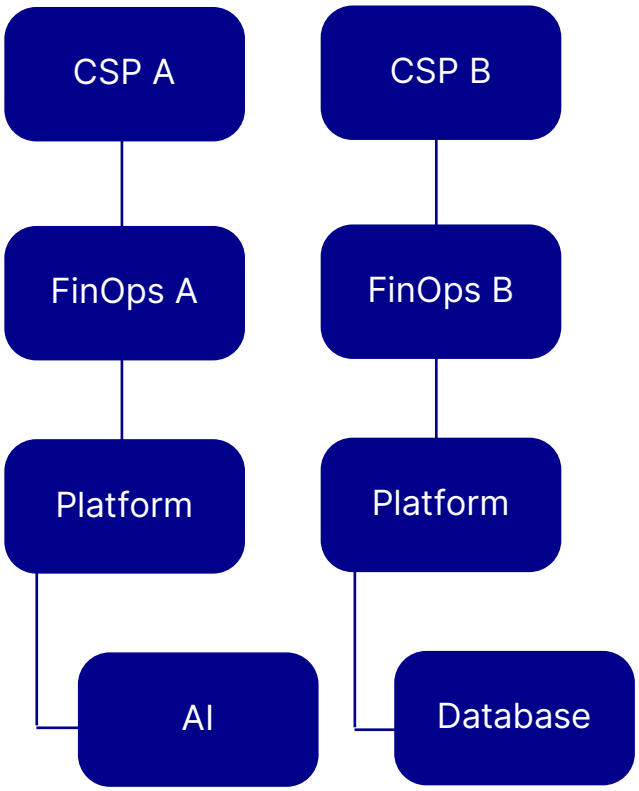

Figure 3. When running cloud-native FinOps tools within each cloud provider, you create a silo that limits cost optimization, cross-cloud visibility of costs, and more.

By reducing the cost of cloud infrastructure, organizations can allocate more resources to innovation that allows them to explore new technologies, develop new products and services, and find new ways to meet the needs of their customers.

Lack of cross-cloud visibility and observability

This problem must be solved when dealing with complex cloud deployments and, thus, complex cloud cost management. Siloed tools provide siloed views of each CSP's cloud costs data and information, such as usage, prices, and other fees. Cross-cloud FinOps observability is critical to managing complex cloud costs, which is the topic of this paper. As we saw in our previous example, we can't build insights to deal with cross-cloud dependencies. Thus, pricing is impossible for FinOps observability across complex cloud deployments that leverage complex cloud costs.

FinOps needs to focus more on humans

Cloud FinOps is often viewed as a set of processes and tools aimed solely at reducing costs and optimizing usage. However, the benefits of FinOps extend far beyond cost savings and can provide significant value to humans in various ways. Let's examine how FinOps can give value to humans by improving operational efficiency, promoting innovation, and enhancing the user experience.

First, FinOps can optimize cloud infrastructure to meet specific needs by providing direct feedback to IT teams. For example, a cloud FinOps observability system can provide immediate feedback based on use patterns. Let's say we task FinOps to identify a pattern of developers not de-provisioning cloud storage instances after their use. The business no longer incurs the cost of running those services when they're unnecessary. The idea here is to work with human partners to ensure cost optimization whenever possible using manual and automated functions.

Second, FinOps can enhance the user experience by delivering better customer products and services. By leveraging key FinOps tools to monitor usage and optimize resource utilization, organizations can ensure that their products and services are available and perform well when users need them, leading to a more positive human user experience. Optimized cloud infrastructure costs ensure that products and services are reliable, scalable, and cost-effective, leading to a better user experience.

Finally, FinOps can promote innovation by freeing up resources that can be used for new projects and initiatives. By reducing the cost of cloud infrastructure, organizations can allocate more resources to innovation that allows them to explore new technologies, develop new products and services, and find new ways to meet the needs of their customers. This leads to a more innovative and agile organization, which is better equipped to respond to the changing needs of its customers.

Leverage proactive spend controls/Guardrails for engineers

Reactive spend control was discussed in the previous chapters. Proactive spend control, however, is based on establishing self-service guardrails to preemptively prevent costly events, such as using more resources than needed.

Cloud cost observability provided by FinOps technology refers to the ability to monitor and understand the cost of cloud resources in real- time. More importantly, observability offers the ability to see the data as genuine insights to better understand what the data means.

Some FinOps approaches enable you to consolidate offerings from major cloud providers into a single catalog. And then give you the ability to preselect configuration options for developers to choose from. This means avoiding and disabling overly expensive or non-compliant instance types or regions, as an example. In addition, you will want to implement multi-level approval flows and spend limits with warning alerts that are automatically sent out to budget owners when overages are about to occur.

- First, you will want AI to look into past data to provide recommendations as we have discussed in the previous sections.
- Second, however, you will want to consider the possibility that AI suggested recommendations may not always be the best choice for your business.

You will want to vet AI insights by running them by engineers who will be able to assess the veracity of the recommendations. While most of the time, the human evaluation will be to confirm and execute the recommendations provided by the AI system. Organizations must ensure that decisions for optimizing spend are not executed blindly. This is why recommendations are validated by an engineer who may, for example, reject the AI-generated recommendation for right-sizing, because he or she is expecting an increased amount of traffic to a specific VM.

In this way, you will use automation and workflows to consolidate AI and human decision-making for maximizing the ROI of your FinOps program (ITSM solutions can be implemented in this process).

Merge AI-powered recommendations with input from engineers—with automation

FinOps provides you with cost optimization recommendations. But the human factor is indispensable. How do you consolidate AI and human input to ensure most cost-effective decisions? In short, automation processes and workflows that include a manual step for verification. Let’s take a closer look at how the process should flow.

FinOps needs to focus more on cross-cloud observability

Although we touched upon this a few times already, it’s a good idea to focus on the need to provide cloud cost observability. Cloud cost observability provided by FinOps technology refers to the ability to monitor and understand the cost of cloud resources in real-time. More importantly, observability offers the ability to see the data as genuine insights to better understand what the data means.

For example, let’s consider an e-commerce company that uses Amazon Web Services (AWS), Google Cloud Platform (GCP), and several SaaS-based systems for their multicloud deployment. Using a cross-cloud FinOps

FinOps observability enables organizations to understand the cost impact of changes to their cloud infrastructure, such as adding new resources or services and make informed decisions about optimizing their cloud infrastructure to achieve cost savings.

observability tool, they can gain visibility into their cloud costs and usage patterns within and across each CSP. They can now:

- Identify cost trends and other meaningful insights or analyze their monthly costs and usage trends to identify areas across CSPs where they can optimize costs, such as by reducing unused resources or identifying opportunities to use lower-cost services.
- Track cost allocation patterns and insights, or the allocation of costs across clouds, departments, teams, or projects by using resource tagging. This allows both chargebacks and show backs across a complex multicloud deployment, allowing budget management specific to what services are being used, on what cloud, and for what purpose.
- Forecast costs or provide insights into their future cloud costs using historical data and predict future costs based on expected usage patterns. This enables them to effectively plan and budget for their cloud expenses.

Find accurate insights into spending and usage patterns

Some of these observability functions provide more tactical insights, such as tracking cost allocations. However, the real value of cross-cloud FinOps observability is the ability to set up future trend monitoring and insights that may be useful as the organization evolves around its complex cloud deployment, meaning that the cloud costs will also be complex.

Examples of these usage patterns include:

- Predicting the rise of costs related to the increased use of generative AI systems in the cloud. This includes understanding all related expenses, including feeder databases for AI model training and even training for humans operating these systems.
- Understanding the impact of new laws and regulations on the existing multicloud deployment, including costs trending up or down, what services will be affected, and how that will change over time with likely price increases or decreases.
- Finding the most cost-efficient CSP to run a specific application as part of a DevOps toolchain and process deployment. As the application is profiled, the FinOps observability tool can find the most cost-effective cloud platform for operations based on past data and future trends, and automatically deploy that application on the most cost-efficient platform.

One of the key benefits of FinOps observability is that it enables organizations to make informed decisions about their cloud infrastructure and change infrastructure ahead of events that will have a negative impact. FinOps observability enables organizations to understand the cost impact of changes to their cloud infrastructure, such as adding new resources or services and make informed decisions about optimizing their cloud infrastructure to achieve cost savings.

Organizations must adopt a holistic approach to cloud infrastructure to bridge the gap between cloud FinOps and asset management. This means aligning the cloud infrastructure's financial and operational aspects with overall asset management strategies.

Leverage deep analytics and AI for FinOps

FinOps, especially when leveraged as an observability platform, can leverage AI in several ways to optimize cloud usage, reduce costs, and improve the overall efficiency of IT operations. FinOps can and should leverage AI algorithms to:

- Optimize cloud usage and reduce costs automatically. For instance, AI algorithms can identify underutilized resources and recommend ways to right-size them or automatically switch to lower-cost instance types based on usage patterns.
- Analyze historical cloud usage and cost data to accurately predict future costs. This enables organizations to effectively plan and budget for their cloud expenses and avoid unexpected costs.
- Analyze workload requirements and recommend the most efficient resource allocation strategy. For example, algorithms can recommend the optimal mix of reserved, spot, and on-demand instances to achieve the best performance at the lowest cost.
- Use chatbots to answer employee questions about cloud costs, including usage patterns, billing details, and cost optimization strategies. This enables employees to get answers to their queries quickly and frees up FinOps teams to focus on more complex tasks.

The value of AI and FinOps when leveraged as an observability system, is compelling. The idea is to understand how AI can allow FinOps observability to become a more powerful tool. For instance, leveraging raw cloud cost data as training data for an AI system can provide better insights into automated and non-automated processes to optimize cloud usage. We can leverage these trained knowledge models to carry out other helpful activities (such as demand planning) that are more accurate and thus align budgets with actual usage in much more reliable ways.

Bridging FinOps to asset management

Many organizations need help to bridge the gap between cloud FinOps and traditional asset management practices. This situation must be fixed as we develop complex cloud cost management solutions.

While cloud FinOps and asset management share some similarities, there are crucial differences, including how costs are calculated and the management of cloud assets. Cloud FinOps manages cloud expenses and optimizes usage to achieve cost savings. On the other hand, asset management is the management of a company's assets to maximize their value and minimize risk.

Organizations must adopt a holistic approach to cloud infrastructure to bridge the gap between cloud FinOps and asset management. This means aligning the cloud infrastructure's financial and operational aspects with overall asset management strategies. Organizations must track usage, monitor costs, and optimize resource utilization using processes and tools to effectively manage their cloud assets.

Complex cloud cost management requires an accurate and reliable asset management sub-system tightly coupled to the FinOps technology. FinOps observability is especially critical for complex cloud cost management to succeed.

Most importantly, organizations must consider the impact of cloud FinOps on their overall asset management strategies. For example, consider how optimizing cloud usage through FinOps will impact asset utilization and overall cost structure. Also, consider how cloud FinOps will affect the ability to manage and track cloud assets and how that will impact the ability to achieve asset management goals.

The core lesson here is that asset management and FinOps need to work together conceptually and within the FinOps tool. One concept needs the other (see Figure 4). Complex cloud cost management requires an accurate and reliable asset management sub-system tightly coupled to the FinOps technology. FinOps observability is especially critical for complex cloud cost management to succeed.

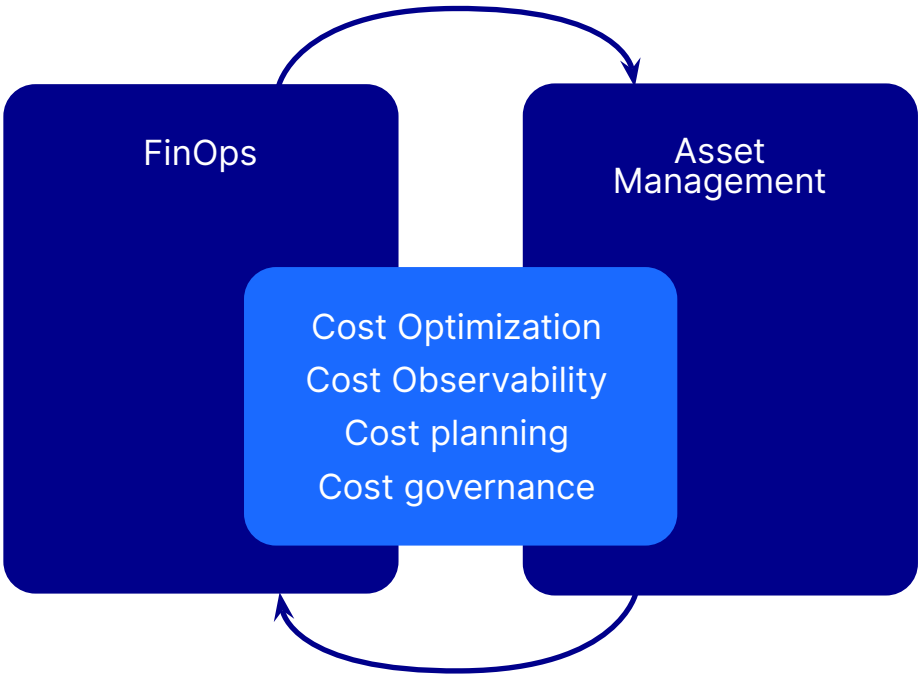

Figure 4. FinOps and asset management must be coupled to provide better cost management and spending optimization.

Other cross-cloud FinOps issues to consider for complex cloud deployments

Although we discussed the benefits of cross-cloud FinOps related to complex cloud deployment cost management earlier in this paper, there are other cross-cloud FinOps advantages to consider: cost optimization, which is not as obvious as it should be. Cross-cloud/multicloud FinOps allow organizations to identify and optimize costs across cloud providers. Visibility into the costs of each cloud provider will enable organizations to compare prices and services and choose the most cost-effective options. This also goes to cost optimization and providing a FinOps observability system that can span clouds and give better insights on issues within or between cloud providers, such as dependency management.

Cross-cloud FinOps allows organizations to choose the right cloud provider for each workload. This can help organizations avoid vendor lock-in and choose the most appropriate cloud provider for each application or service.

Flexibility and agility are other core benefits. Cross-cloud FinOps allows organizations to choose the right cloud provider for each workload. This can help organizations avoid vendor lock-in and choose the most appropriate cloud provider for each application or service. This means we can automatically look at the characteristics of each workload and determine the best platform fit on the fly during deployment. We can also optimize after deployment, such as relocating backup and recovery storage (commodity cloud storage services) to the cloud provider with the best reliability and pricing.

Cross-cloud FinOps can enable organizations to use the latest cloud technologies and services from different cloud providers. This can help organizations innovate faster and stay ahead of the competition. The idea is to track costs and cost optimization across cloud providers. Thus, it's easier for those who need to leverage services from many different CSPs to find the best-of-breed services that are optimal for their solution and those that provide the best cost efficiency and innovative value.

The core value of cross-cloud/multicloud FinOps as it relates to complex cloud cost management is to provide a centralized entity to manage costs and fundamental financial governance mechanisms. We don't want to deal with the additional heterogeneity of a multicloud by placing a FinOps system on each cloud. Instead, we leverage a single tool that spans clouds and sees all data points required to provide the best cost-control operations and observability.

This centralization of essential FinOps services will centralize FinOps governance services. For instance, a single policy can span clouds and enforce policies using whatever native interfaces must be leveraged on a specific CSP. The policies are set once and carried out how they need to be without dealing with the complexities of each native interface.

The real benefit here is the common control plane which can sit logically above the cloud providers. This supplies a single location and interface that FinOps staff can leverage to provide a common conceptual view of all spending without dealing with the complexity of cost tracking in each cloud provider. For example, having a single way to track and understand storage costs across multiple clouds.

This also gets to the common benefit of observability and the common theme of this paper. Observability can find meaning in data and use that meaning in many pragmatic ways. When we can see all cost data that spans cloud providers, we can leverage core observability processes and analytics to find largely invisible trends in raw data. This is often called "noise" by those dealing with vast amounts of FinOps operational cost data. That noise can provide invaluable information.

While cloud providers work to minimize their carbon footprint, their data centers, the backbone of the cloud, consume a significant amount of energy and produce large amounts of carbon emissions.

Sustainability audit support for cloud deployments

Businesses are increasingly focused on achieving sustainability and reducing their carbon footprint. At the same time, the cloud computing industry has proliferated, with organizations relying on cloud infrastructure to support their operations. So, how are cloud FinOps and sustainability-related? This looks briefly at the emerging, critical feature of FinOps, both as a concept and a technology.

It's important to understand that cloud infrastructure significantly contributes to organizations' carbon footprints. The carbon footprint of all industries is increasing as more organizations rely on the cloud. While cloud providers work to minimize their carbon footprint, their data centers, the backbone of the cloud, consume a significant amount of energy and produce large amounts of carbon emissions.

To address this challenge, cloud providers have made sustainability a priority. They are investing in renewable energy and adopting energy-efficient technologies to reduce the carbon footprint of their data centers. This helps reduce their carbon footprint and makes the cloud a more sustainable option for organizations looking to reduce their carbon footprint, which aligns with the core purpose of FinOps and sustainability.

FinOps is critical in promoting sustainability in the cloud because a more cost-efficient cloud deployment is greener. By leveraging FinOps tools and processes to optimize cloud usage, organizations can reduce the amount of cloud infrastructure they need, thereby reducing their carbon footprint. Win-win.

ESG stands for environmental, social, and governance. It is a term that describes the three key factors that measure the sustainability and ethical impact of an organization's operations and practices. Also consider the issues around compliance to specific set standards, such as ESG metrics. Many investors, and even governments, require that companies track their ESG scores, and thus the need to do so through FinOps approaches and tooling. Sustainability audits will become more common, and FinOps allows you to work through those processes quickly and understand the state of your ongoing sustainability efforts, not just at the time of an audit.

Another aspect of sustainability is looking at the source cloud's sustainability ranking. While we're picking cloud platforms and resources based on cost, FinOps tools can also analyze the power sources of cloud services. One could use coal-burning power while another uses renewable energy. Leveraging the cloud resource that puts out the smallest amount of carbon could be advantageous.

The core message in this paper is that we need to rethink how FinOps works, how it's applied, and what tools are most valuable to make FinOps work for complex cloud deployments. This means understanding your requirements, including cloud services leveraged now and those that will likely be leveraged in the future

Call to action

So, what is the path forward for FinOps, related to fighting cost complexity with cloud computing? First is to understand that all cloud deployments are now more complex. This is no longer a trend but a fact. Over 90 percent of enterprises that leverage the cloud use two or more public cloud providers.

Too many services to monitor and different terms in SLAs (service level agreements) create complexity around cloud costs, usage, terms, per-service billing, optimization, and other factors that a single human or humans cannot track. There is additional complexity around cloud costs, including usage, terms, per-service billing, optimization, and other factors that will lead to under-optimized cloud costs due to the underlying complexity. Thus, a FinOps tool, approach, and program are needed.

But we can't just toss a tool at the problem and hope for the best. A culture change could be needed to adapt to the accountability and disciplines required to drive a successful FinOps program and systems. This requires a core understanding of what FinOps is and does, and how to use FinOps to manage complex cloud deployments, resulting in difficult cloud costs that must be addressed.

A FinOps tool should also support asset management, and you should understand the cross benefits. Include core capabilities, such as FinOps observability, to find the meaning within your meaningless raw cost data. Most importantly, pick FinOps approaches and tooling that support plural cloud deployments and provide a common set of FinOps processes and data management services that can operate across cloud providers. Implementing a single cloud provider solution is undesirable, even if you do it for a single cloud deployment.

Finally, consider FinOps and its role in managing sustainability. The good news is that a cost-efficient cloud deployment is also a sustainable deployment. However, there are complexities to this, such as instances where the least expensive cloud service is also the least sustainable. Those issues need to be understood and managed.

The core message in this paper is that we need to rethink how FinOps works, how it's applied, and what tools are most valuable to make FinOps work for complex cloud deployments. This means understanding your requirements, including cloud services leveraged now and which will likely be leveraged in the future. Then, putting together sound FinOps programs that are holistic in considering humans' IT resources, costs, sustainability, and the ability to support the business. This effort can return many times the value to the company.

About the author

David Linthicum is on most top 10 lists of technology innovators and influencers, including cloud computing, edge computing, and security concepts. He's an innovator within Service-Oriented Architecture (SOA), and now cloud computing and the use of cloud computing for digital transformations. He also originates many business-related technology concepts, including Enterprise Application Integration (EAI). David is a best-selling author of 17 books and over 7,000 published articles. His latest book is "An Insider's Guide to Cloud Computing," released in 2023.

David's 50+ courses on LinkedIn Learning consistently appear on the "Popular Courses" list and provide course content on cloud

computing, cloud architecture, cloud security, cloud governance, cloud operations, DevOps, and many other concepts related to cloud computing and enterprise technology in general. He's also an adjunct professor for Louisiana State University (LSU), where he's created courses on DevOps, Cloud Computing, Cloud Architecture, and other courses that are in demand by the LSU student body. David has done over 1,000 conference presentations in the U.S. and abroad, often as a keynote speaker at conferences related to enterprise technology. He has hosted over 2,000 webinars on the correct use of enterprise technology, including cloud computing, edge computing, DevOps, and data science.

David's holistic view of the technology value model cuts through the hype cycles and other distractions to provide clear solutions. He aims to provide opportunities for businesses to lead their markets by weaponizing technology to offer better products, services, and customer experiences. His mission is to use innovative technology approaches that provide the best outcomes for his clients.

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