

ENHANCING CLOUD FINANCIAL OPERATIONS WITH AI

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Abstract: As organizations increasingly rely on cloud services, the need for effective Financial Operations (FinOps) becomes crucial. The focus has shifted from merely managing costs to maximizing Return on Investment (ROI) while ensuring the cloud delivers the most value to the business. By applying AI to financial operations in the cloud, companies can streamline cloud cost management, increase operational efficiency, and enable strategic growth, ensuring they maximize the value of their cloud investments. The goal of this article is to walk you through key FinOps principles and help get the most ROI from your cloud infrastructure using AI.

Key words: FinOps, ROI, cloud, AI, automation



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This Publication has to be referred as: Seremet, Z[eljko] & Rakic, K[resimir] (2024). Enhancing Cloud Financial Operations with AI, Chapter 12 in DAAAM International Scientific Book 2024, pp.149-160, B. Katalinic (Ed.), Published by DAAAM International, ISBN 978-3-902734-42-6, ISSN 1726-9687, Vienna, Austria
DOI: 10.2507/daaam.scibook.2024.12

1. Introduction

The rapid adoption of public cloud services is reshaping the IT landscape, with growth rates surpassing 16% annually. Beyond reducing traditional IT costs, cloud migration is expected to drive over \$1 trillion in business value by 2030, according to McKinsey Digital. However, many organizations are struggling to capture this potential. Despite heavy investment in the cloud (Celar et al., 2011), 80% of CIOs admit they have yet to meet their cloud migration value goals, and estimates suggest that more than 30% of cloud spending is inefficient or wasted. (Forrest et al., 2021)

A key challenge lies in relying on outdated financial processes designed for on-premise data centres, which fall short in managing and forecasting cloud costs. Unlike traditional IT, where costs are more predictable, cloud environments demand dynamic, real-time financial oversight.

This has led to the rise of FinOps (Cloud Financial Operations), which has quickly become essential for managing cloud costs and maximizing value. Currently, 82% of enterprises have formalized FinOps practices, as cloud adoption accelerates, and IT budgets continue to soar—reaching an average of \$367 million annually for large organizations. FinOps provides the financial governance and operational visibility necessary for businesses to navigate the complexities of cloud spending and capture the true value of their cloud investments. (Forrest et al., 2021)

So, in the second chapter, we discuss what is the FinOps and how to be transforming financial management for strategic value creation. The third chapter will describe the empowering FinOps through automation, and in the fourth, a conclusion is given.

2. Harnessing the Power of FinOps: Transforming Cloud Financial Management for Strategic Value Creation

In today's rapidly evolving digital landscape, FinOps emerges as a crucial discipline for organizations navigating the complexities of cloud financial management. By bringing financial accountability to variable cloud spending, FinOps empowers businesses to make data-driven decisions about their cloud investments while aligning costs with overarching business objectives.

2.1. What is FinOps?

FinOps is a cloud financial management discipline that helps organizations bring financial accountability to variable cloud spending. The goal is to enable businesses to make data-driven decisions about cloud investments while aligning cloud costs with business objectives.

Core Tenets of FinOps:

- **Visibility:** Gain real-time insights into cloud costs and usage.
- **Optimization:** Continuously optimize cloud resources for performance and cost efficiency.

- **Accountability:** Ensure that every team and department takes ownership of their cloud spending.
- **Agility:** Quickly adjust cloud strategies in response to market changes or shifts in business priorities. (Storment & Fuller, 2019)

2.2. *The Shift from Cost-Cutting to Value Maximization*

Historically, managing cloud costs was seen as a tactical endeavour focused on reducing expenses and avoiding over-provisioning. Today, the goal is much broader: it's about maximizing the value of every cloud dollar spent.

Key Objectives of Value-Driven Cloud Strategies:

- **Optimize ROI:** Ensure that every cloud investment yields business benefits, whether that's improved performance, faster time-to-market, or increased revenue.
- **Strategic Alignment:** Align cloud decisions with business goals, such as improving customer experiences or scaling innovation.
- **Sustainability:** Manage cloud resources efficiently while maintaining business agility and long-term growth. (Storment & Fuller, 2019)

2.3. *Why FinOps Is Essential in Today's Cloud-First World*

Cloud costs are highly variable and can easily spiral out of control without proper management. As companies increasingly move workloads to the cloud, the challenge isn't just about reducing costs; it's about maximizing value from every cloud dollar spent.

Key Benefits of Implementing a FinOps Practice:

- **Cost Control:** Proactively manage and forecast cloud expenses, reducing the risk of overspending.
- **Business Alignment:** Ensure cloud investments deliver tangible business value by aligning spending with business goals.
- **Agility:** Empower organizations to make faster decisions about cloud services, enabling quicker responses to market changes. (Storment & Fuller, 2019)

2.4. *The FinOps Lifecycle: Key Phases for Cloud Financial Management*

The FinOps lifecycle helps teams manage cloud spending efficiently and includes three key phases:

1. **Inform Phase: Creating Visibility**

- Focus on providing visibility into cloud costs and usage.
- **Best Practices:**
 - **Cost Allocation:** Use tagging to assign costs to specific teams or projects.
 - **Real-Time Dashboards:** Create dashboards for instant access to cloud costs.
 - **Budgeting and Forecasting:** Set up budgets based on historical usage to avoid cost spikes.

2. **Optimize Phase: Reducing Costs and Driving Efficiency**

- Analyse usage patterns and identify optimization opportunities.

- **Key Strategies:**
 - **Rightsizing:** Regularly review resource sizes for appropriate workloads.
 - **Reserved Instances:** Use RIs or Savings Plans for long-term discounts.
 - **Auto-Scaling:** Implement auto-scaling to use resources efficiently.
 - **Spot Instances:** Leverage spot instances for non-critical workloads.

3. Operate Phase: Enforcing Governance and Accountability

- Ensure consistent enforcement of cost-saving practices.
- **Key Actions:**
 - **Automated Policies:** Set up policies for tagging standards and resource management.
 - **Regular Reviews:** Conduct cost reviews with stakeholders to align budgets.
 - **Governance:** Establish frameworks for financial controls and compliance. (Storment & Fuller, 2019)

2.5. Key Challenges in FinOps Implementation

While FinOps offers tremendous value, it also presents certain challenges:

a) **Scaling Best Practices Across Teams:**

Solution: Build a Cloud Center of Excellence (CCoE) to standardize practices and share insights.

b) **Lack of Insights for Value-Oriented Decisions:**

Solution: Implement real-time dashboards that provide actionable insights beyond simple cost metrics.

c) **Cloud Tagging Complexity:**

Solution: Use automation tools for tagging and enforce policies with periodic audits.

d) **Delayed Action from Insights:**

Solution: Set up real-time monitoring and automated alerts for spending anomalies.

2.6. FinOps Metrics for Maximizing ROI

To ensure that your FinOps practice is driving real business value, measure success using key metrics:

- **Cost per Customer:** Relate cloud spending to customer service costs.
- **Cost per Transaction:** Measure spend per transaction for operational efficiency.
- **Savings Realized:** Track cost savings achieved through optimization.
- **Cloud Spend Variance:** Monitor the difference between actual and forecasted spending.
- **Cloud Resource Utilization:** Ensure efficient use of cloud resources. (Storment & Fuller, 2019)

2.7. From Cost-Cutting to Strategic Value Creation

FinOps is no longer just about controlling costs—it's about leveraging cloud financial management for innovation, growth, and business value creation. As organizations scale their cloud environments, the focus will shift towards enabling teams to make smarter, more value-driven cloud decisions that tie directly to business outcomes. (Forrest et al., 2021)

3. Empowering FinOps Through Automation

In the **State of FinOps 2024** report (State of FinOps '24), one of the key priorities for FinOps practitioners is **enabling automation** to streamline processes, optimize cloud costs, and empower engineers to take proactive actions. Automation in FinOps is crucial for fostering a culture of accountability, where engineers can actively manage and optimize their cloud usage in real-time, rather than simply following compliance or cost-control directives. Automation helps address the complexity of modern cloud environments, where resource consumption can scale rapidly, and costs can spike unpredictably. As organizations scale their cloud usage, manual processes for monitoring and managing cloud costs become insufficient. Automation brings several benefits to FinOps teams:

1. **Operational Efficiency:** Automated systems can continuously monitor cloud usage, identify inefficiencies, and trigger actions, allowing teams to focus on higher-level strategy instead of routine tasks.
2. **Real-Time Insights and Responses:** Automation enables real-time visibility into cloud costs and usage. It can trigger immediate corrective actions when spending exceeds predefined thresholds, preventing budget overruns before they happen.
3. **Continuous Optimization:** Automated tools analyse workloads and cloud services to continuously recommend cost optimizations, such as rightsizing instances, shifting to spot or reserved instances, or using the most cost-effective storage solutions.
4. **Empowerment of Engineers:** Automation allows engineers to access the tools and data they need to optimize their own resources. This shift gives engineers ownership of cloud cost management, ensuring that optimization is a shared responsibility across teams.

3.1. Integration of SaaS and On-Premise Spend

The integration of SaaS and on-premise spend is an emerging priority for organizations as they increasingly adopt hybrid IT environments. In this context, it's crucial to have unified financial visibility and management across both SaaS (Software-as-a-Service) applications and on-premise infrastructure. Efficiently managing these two areas together helps organizations optimize costs, maintain financial control, and achieve better alignment with business objectives. The Fig. 1. highlights a cost comparison between on-premise and SaaS model, and the aforementioned management of hybrid cloud environments, which include not only Infrastructure as a Service (IaaS), but also Software as a Service (SaaS) and on-premises components. (Barabakh, 2024)

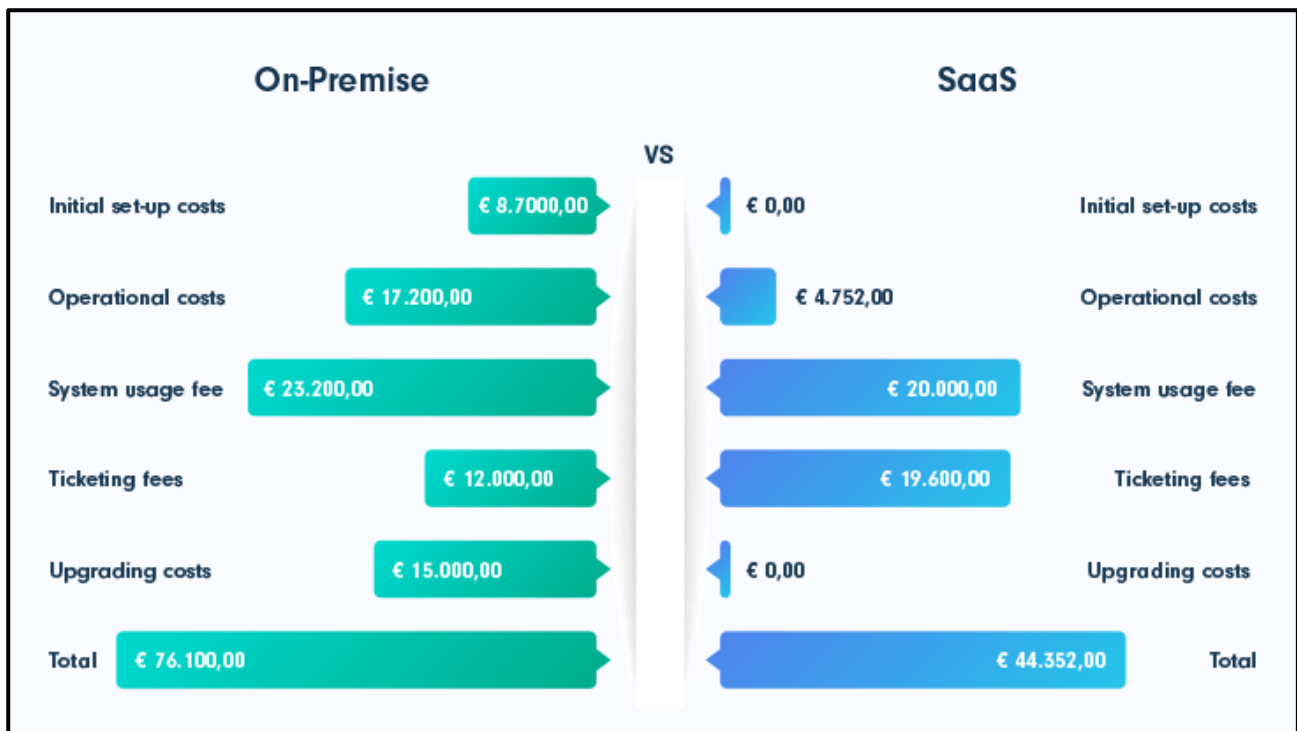


Fig. 1. On-Premise version SaaS (Barabakh, 2024)

In a hybrid-cloud setup, effective management and visibility across all platforms (on-premise, IaaS, and SaaS) is essential. A comprehensive view of spending across these environments is a key principle of FinOps, especially considering the financial complexity that arises from managing both cloud and on-premise infrastructure simultaneously. Here's how a hybrid-cloud FinOps approach would look:

1. Unified Financial Management:

- Track costs from IaaS, PaaS, SaaS, and on-premise solutions in a single view. This ensures transparency across different platforms and helps identify potential areas for cost optimization.

2. Optimization of Resources:

- With a hybrid model, it's important to allocate workloads to the most cost-effective platform. For instance, workloads requiring scalability could be shifted to cloud environments (IaaS), while sensitive data or legacy systems might remain on-premise.

3. Cost Visibility & Accountability:

- The ability to attribute spending to specific departments, products, or teams across IaaS, SaaS, and on-premise platforms ensures proper financial accountability and forecasting.

4. Strategic Flexibility:

- Hybrid-cloud setups allow organizations to leverage the **scalability** of cloud (IaaS/SaaS) while maintaining **control** over sensitive data on-premise. Monitoring costs and optimizing spend across this mix is crucial for ensuring **efficiency**.

FinOps principles are key in such scenarios to enable companies to maximize value, prevent cloud sprawl, and ensure spending aligns with business objectives.

Moreover, creating a culture of accountability and leveraging AI-powered tools for forecasting will enable better planning, governance, and decision-making across the enterprise.

3.2. AI-Augmented FinOps

AI-Augmented FinOps refers to the use of artificial intelligence to enhance FinOps (Financial Operations), which focuses on optimizing cloud financial management. In practice, AI can assist in automating and improving the accuracy of financial processes such as budgeting, cost optimization, forecasting, and resource allocation, especially in complex cloud environments. By analysing vast amounts of data, AI can provide real-time insights, identify cost-saving opportunities, predict future spending, and optimize cloud resources based on demand.

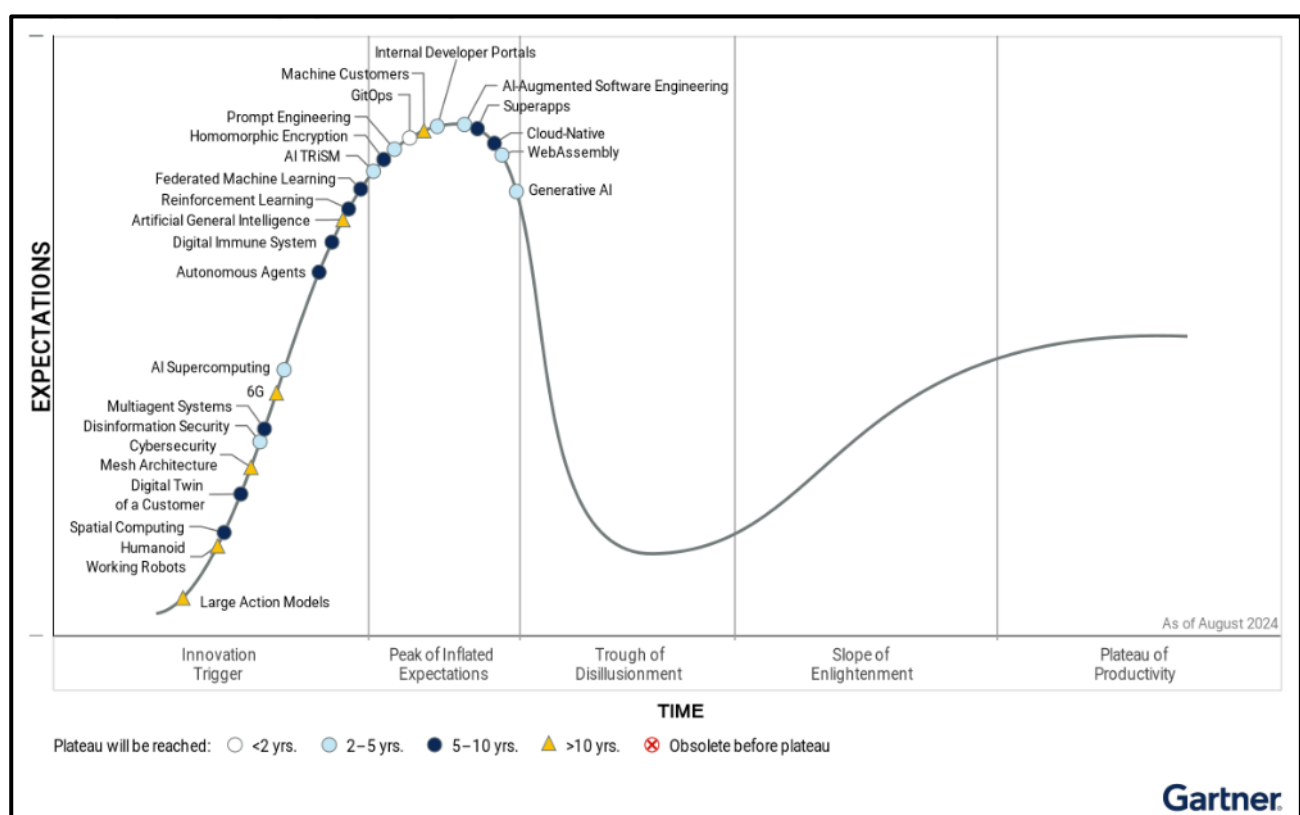


Fig. 2. Gartner's Hype Cycle (Gartner Hype Cycle, 2024)

In the Gartner Hype Cycle you shared, AI-Augmented FinOps appears in the "Innovation Trigger" phase. This means it's an emerging technology, just starting to gain attention and showing early promise, but it may still be in the experimental or conceptual stage for many organizations. As it matures, it is expected to help companies better manage their cloud finances through advanced automation and predictive analytics. (Gartner Hype Cycle, 2024)

3.3. AI in Enterprise Tooling

The integration of AI in enterprise FinOps tooling is transforming the way organizations manage financial operations in the cloud.

As AI becomes a core part of enterprise architecture, it brings with it specific demands to ensure efficiency, transparency, and security. Here are three critical requirements:

1. **Security and Data Protection:** AI systems rely on vast amounts of sensitive data, making security paramount. Enterprise FinOps tooling must ensure:
 - **Data Privacy:** Protecting personal and confidential information through robust encryption, access control, and compliance with privacy regulations like GDPR. (Abadi et al., 2016)
 - **AI Model Security:** Preventing unauthorized access to AI models and ensuring they are safeguarded from threats like adversarial attacks. (Goodfellow et al. 2015)
2. **Explainable and Auditable AI Systems:** As AI takes on a more significant role in decision-making processes:
 - **Explainability:** AI systems must provide insights into how decisions are made, enabling stakeholders to trust and act on AI-driven recommendations.
 - **Auditing:** It's essential that AI processes within FinOps are transparent and maintain audit logs to comply with financial and regulatory standards. (Ribeiro et al. 2016)
3. **Reliable and High-Performance AI Architectures:** Enterprise-scale AI applications require:
 - **Scalability:** Cloud architectures that can dynamically scale to meet the computational demands of AI workloads. (Dean et al. 2012)
 - **Performance Optimization:** AI models need to run efficiently, ensuring that cloud costs are optimized while delivering fast and accurate results. (Varghese et al. 2018)

Meeting these demands ensures that AI-driven FinOps tooling can operate securely, transparently, and efficiently in enterprise environments.

When forecasting AI services costs in the cloud, it is essential to understand the key domains of AI functionality and their associated costs. Costs arise from various operations that scale with both quantity and complexity. Here are some domains that need to be forecasted for accurate spend projections:

- **Prompt Tuning:** This involves optimizing prompts through manual or automatic methods, potentially with built-in guardrails to ensure proper performance.
- **Examples in Prompt:** Zero-shot and few-shot learning influence how AI models respond to different types of prompt inputs, both static and dynamic.
- **Retrieval Assisted Generation (RAG):** This function retrieves facts and injects them into prompts, enabling a more factual response through a chain of retrieval steps.
- **Fine Tuning:** Adjusting models to enhance quality, reduce bias, and minimize hallucinations across proof of concept (POC), staging, and production environments.
- **Reinforcement Learning from Human Feedback (RLHF):** Involves modifying the reward function based on human feedback, with varying scales of human involvement, to improve AI responses over time.

- **Model Training from Scratch:** Creating new models through iterative training processes. Deciding when to reuse or refine models versus training new ones can significantly impact costs depending on innovation pace, quality requirements, and iteration frequency. (Li et al. 2020)

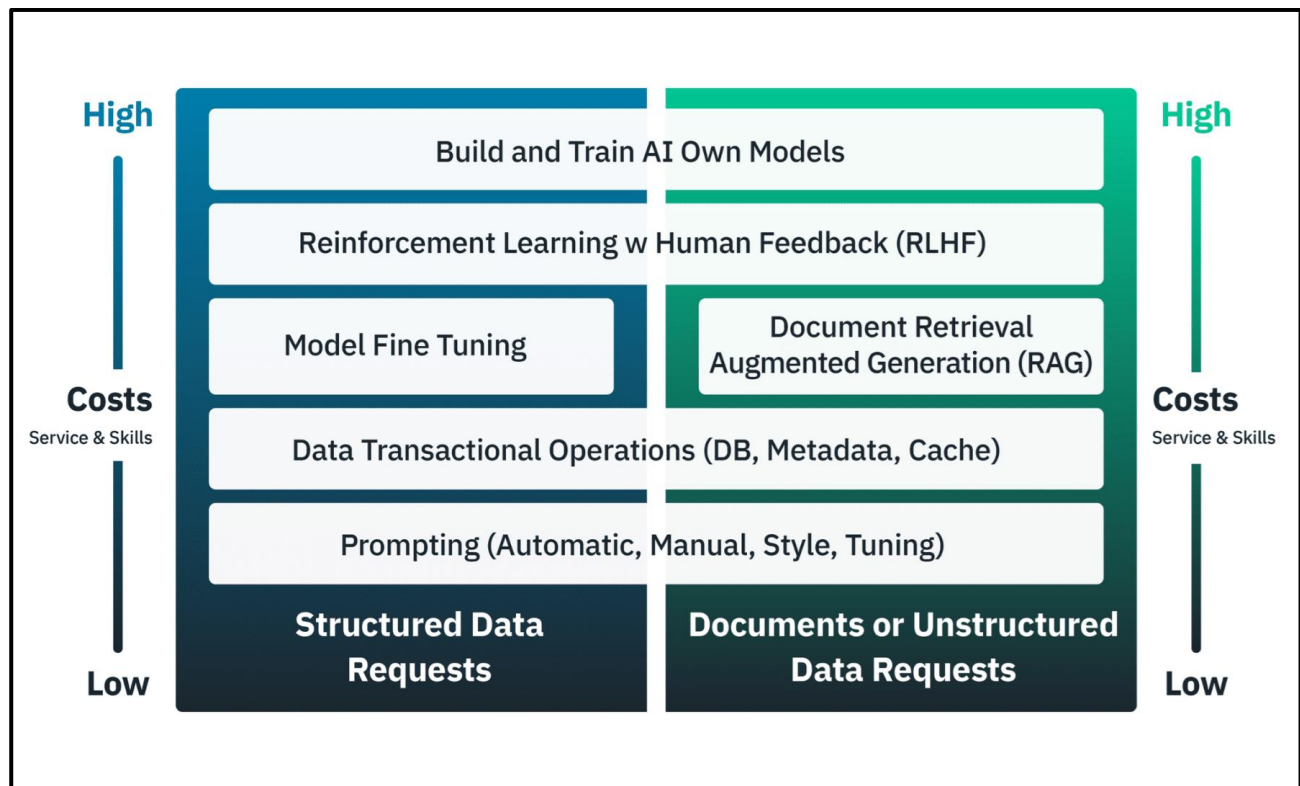


Fig. 3. How to Forecast AI Services Costs in Cloud (FinOps Foundation, 2024)

By understanding these key domains and applying the quantity * rate = cost formula, organizations can develop more accurate forecasts for total AI spend and optimize their cloud-based AI services. This holistic approach allows enterprises to balance accuracy, quality, speed, and costs effectively.

3.4. AI as a FinOps Accelerator

The integration of Artificial Intelligence (AI) into the FinOps framework can significantly enhance financial operations and strategic decision-making. By leveraging AI technologies, organizations can streamline processes, improve accuracy, and provide deeper insights into cloud financial management. Here's how AI can act as a FinOps accelerator:

1. Lowering the Barrier to Entry

- **Accessibility of Financial Insights:** AI-driven tools can simplify complex financial data and present it in intuitive formats, making insights accessible to all stakeholders, from finance teams to technical staff. This democratization of information enables non-financial professionals to understand and act on financial metrics, fostering a culture of financial accountability across the organization.

- **User-Friendly Interfaces:** AI applications often come with natural language processing capabilities, allowing users to query financial data in plain language, further lowering the barrier to entry. (Puschmann, 2017)

2. Reducing Tediousness

- **Process Automation:** AI can automate repetitive FinOps tasks, such as data collection, reporting, and resource tagging. This not only saves time but also minimizes human error, leading to more accurate financial records. (Huang et al. 2021)
- **Streamlined Tagging and Forecasting:** Automated tagging tools powered by AI can dynamically categorize cloud resources based on usage patterns, ensuring accurate cost allocation without manual intervention. Additionally, AI-driven forecasting models can predict future cloud spending based on historical usage, improving budget planning. (Wang et al. 2018)
- **Smart Alerts and Notifications:** AI can analyse spending patterns in real-time, sending alerts when anomalies are detected or when spending approaches budget limits, allowing for prompt corrective actions.

3. Offering New Insights

- **Advanced Data Analysis:** AI excels at processing and analysing large datasets, uncovering financial trends and patterns that may not be immediately apparent. This capability allows organizations to make data-driven decisions that enhance their cloud investments. (Shafiq et al. 2020)
- **Predictive Analytics:** By employing machine learning algorithms, AI can forecast future cloud costs and usage based on historical data, helping organizations anticipate expenses and adjust strategies proactively. (Vasudevan et al. 2020)
- **Benchmarking and Optimization:** AI tools can compare an organization's spending and performance against industry benchmarks, providing insights into potential areas for cost savings and efficiency improvements. (Li et al. 2020)

4. Aligning AI with Meaningful Outcomes

- **Focus on Strategic Goals:** The implementation of AI in FinOps should be driven by clear objectives. Organizations must identify specific pain points in their financial processes and tailor AI applications to address these issues.
- **Continuous Evaluation and Adaptation:** It's crucial to monitor the performance of AI tools regularly and adjust their use based on evolving business needs and objectives. This ensures that AI not only drives innovation but also delivers tangible benefits aligned with the organization's FinOps practices. (Singh et al. 2021)

AI has the potential to transform the FinOps landscape by making financial insights more accessible, automating tedious tasks, and providing deep analytical capabilities. By strategically integrating AI into FinOps processes, organizations can not only improve operational efficiency but also enhance decision-making, ultimately leading to better management of cloud investments and greater overall value creation. As organizations continue to embrace AI, it's essential to align these innovations with meaningful outcomes that support and enhance FinOps practices.

4. Conclusion

In an era where cloud adoption is accelerating and financial pressures are mounting, the integration of Artificial Intelligence (AI) into Financial Operations (FinOps) presents a transformative opportunity for organizations. The traditional approaches to managing cloud spending are increasingly inadequate for navigating the dynamic and complex nature of cloud environments. As demonstrated throughout this article, FinOps is not merely a cost-cutting initiative but a strategic framework that empowers organizations to maximize the value derived from their cloud investments. By leveraging AI, companies can automate routine tasks, enhance decision-making capabilities, and provide real-time insights into financial performance. AI tools can transform raw data into actionable insights, enabling organizations to make informed decisions that align cloud spending with overarching business goals. Moreover, the automation of cost allocation, forecasting, and resource optimization helps mitigate the risks associated with variable cloud spending, thus fostering a culture of accountability across teams.

However, the successful integration of AI into FinOps requires a careful approach that encompasses security, explainability, and performance optimization. Organizations must prioritize the establishment of robust governance frameworks that ensure compliance with financial regulations while safeguarding sensitive data. By cultivating a strategic mindset and fostering collaboration between finance and technical teams, businesses can create a cohesive approach that drives innovation and operational efficiency.

Ultimately, embracing AI in FinOps will not only facilitate enhanced financial management but will also empower organizations to adapt to evolving market demands. As cloud environments continue to expand, those that leverage AI to optimize their financial operations will be better positioned to drive strategic growth and realize the full potential of their cloud investments. The future of FinOps lies in the integration of advanced technologies, transforming financial operations from a traditional cost management function into a dynamic driver of business value and innovation.

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