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A Study On The Finops Framework For Sustainable Cloud Engineering

Prasanjit Singh Research Scholar, Department of Computer Science, Sikkim Professional University, Gangtok, (Sikkim)

Dr. Vishal Khatri Research Supervisor, Department of Computer Science, Sikkim Professional University, Gangtok, (Sikkim)

ABSTRACT

A growing number of businesses are moving to the cloud or setting up shop there in order to take advantage of the greater business efficiency, scalability, and flexibility provided by this technology paradigm. However, cloud service providers often neglect how normal ICT Financial Management practises affect the variable pay-as-you-go cost model. Increased delegation of expenses to business users, who frequently utilise cloud services directly, pose the risk of decreasing the Finance department's understanding of the costs spent, which would jeopardise the precision of spending estimates. The objective of this research is to assess how cloud monitoring technologies can be used in conjunction with FinOps methodologies and approaches, such as cost allocation, budgeting, and forecasting, to maximise cloud cost efficiency. The final step involves the qualitative technique that has been suggested for assessing the level of maturity of Cloud Financial Management practises. This research study came to the conclusion that combining FinOps with cloud monitoring technologies can provide a comprehensive method of cost optimisation in cloud systems. Good data management, tool integration, and team communication are necessary for this plan to be implemented successfully. By using the concepts and strategies presented in this study, businesses can optimise costs while retaining system efficiency and functionality.

Keywords: Cost optimization; Cost allocation; FinOps; Budgeting; Multi-cloud monitoring; Forecasting.

1. INTRODUCTION

Most modern ICT systems are gradually moving services, apps, and databases to the cloud to maximise profits and minimise startup costs. The "pay as you go" payment method provided by cloud computing providers is one of the factors influencing this movement. Businesses can lower the amount of capital they invest in their own infrastructure by using this method. A company would need to spend a lot of money and time before they could provide services that were on par with those offered by public cloud providers if they wanted to maintain their own infrastructure (Sannino, 2022). Since several cloud computing service providers started using this method of payment, there has been

accumulating evidence showing that doing so provides several advantages (Mei, 2023). The evaluation procedure for cloud services should take into account the following five criteria: (1) adaptability, (2) scalability, (3) accessibility, (4) performance, and (5) security (Lamanna, 2022).

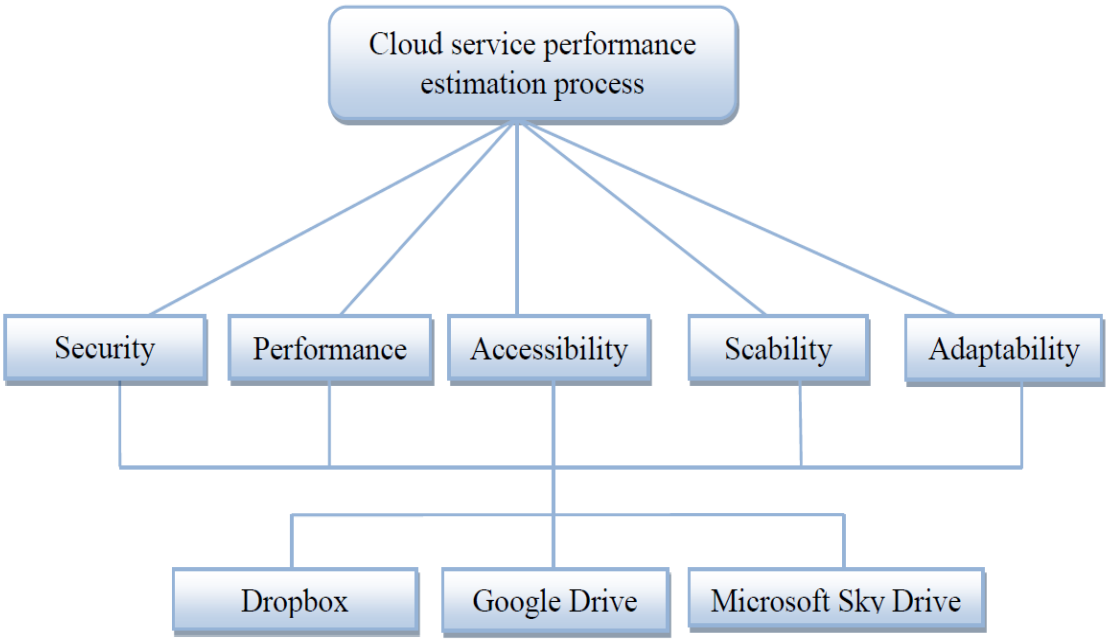

Figure 1: The hierarchical structure of criteria and alternatives (Abdel-Basset et al., 2018)

It's difficult to choose the best cloud computing provider. In addition to financial cost, organisations must consider time spent on the process. Cloud computing migration plans can be difficult to determine for enterprises, especially those with old systems. Before picking a vendor, companies must examine initial investment and ongoing maintenance expenditures to evaluate cost effectiveness, performance, and upkeep. Multi-cloud's complicated pricing may result in unneeded cloud computing charges. Lack of centralised procurement, unfamiliar cloud-based cost management technologies, and financial accountability lead to operational cost losses (Ericsson, 2020).

"FinOps" was inspired by exorbitant costs in many enterprises. Monitoring cost services are being established to reduce cloud expenses and prove FinOps' feasibility. These systems allow Engineering, Finance, and Delivery departments to collaborate through a unified management interface, enhancing financial control and predictability and reducing expenses. Thus, businesses improve (Chen, 2020). These solutions also provide a uniform management interface for Engineering, Finance, and Delivery collaboration. The previous studies that are relevant to this one are going to be covered in the next section.

2. LITERATURE REVIEW

The research' authors **(Wang et al., 2017; Varghese & Buyya, 2018)** claimed that during the previous ten years, the landscape of cloud computing has undergone significant changes. The number of service providers and services has increased, but there has also been a growth in the cloud infrastructure, which was formerly limited to the data centres of a single service provider. In the conclusion, outline the obstacles that must be addressed to realise the promise of the next generation of cloud systems.

Rashid and Chaturvedi's (2019) work made it possible for businesses and individuals to understand how cloud computing may offer dependable, adaptive, and affordable services for a range of applications. Explore cloud computing services, applications, and traits in this article. Provide several examples of Google, Microsoft, and Amazon cloud services. Discussed cloud computing service models and their benefits.

Financial constraints are economic restraints on behaviour, as per the authors **(Hamilton et al., 2019; Ait Chikh, 2023)**. Review research on how financial constraints effect consumer behaviour since millions of people confront them. This study provided an integrative paradigm based on multiple literatures on financial restrictions. Resource scarcity, choice constraint, social comparison, and environmental unpredictability are the framework's four perspectives.

El-Haddadeh (2020) stated that digitally creative technology allows organisations to create opportunities to get a competitive edge. To succeed, these technologies must comprehend the dynamics that affect their acceptability. While much research has focused on the development, deployment, and employee adoption of new technology, less has examined how digital innovation affects corporate technology adoption. This essay examined how SMEs adapt innovation dynamics in cloud computing.

Li et al. (2022) claimed that cloud computing, a fresh approach to the information industry, will be the engine of future advancement. The cloud computing sector follows the trend of organisations focusing more on cost reduction, efficiency, and streamlining processes. Due to worldwide economic decline. Does cloud computing raise or justify a firm's costs? In a business homogeneous rivalry, cloud infrastructure cost, investment, and operation affect corporate cloud business market competitiveness.

ICT Financial Management makes IT strategic by revealing its business worth. Assess IT services' financial influence on business performance **(Storment & Fuller, 2023).**

Previous research indicates that since the advent of public cloud, the cloud sector has actively promoted hybrid news to businesses. This push was started by cloud computing. Because not all work will be shifted there, some cloud service providers and system integrators promised to seamlessly connect this company's data centre to the public cloud. Although challenging, integrating on-premises systems with cloud storage is still advantageous. This paper explores the finops framework for environmentally friendly cloud engineering.

3. METHODOLOGY

First, the Cloud Transformation Observatory's study on cloud cost control and optimisation and FinOps is presented and discussed to determine maturity. The expansion of cloud-based services with an emphasis on financial operations is the subject of this material. Then, investigations of practitioner interviews focus on the foundations, levers, and priorities of cloud financial management. Practitioner interviews provided the data for these investigations. These empirical findings serve to support the identified managerial levers by providing additional empirical evidence and legitimacy. There were a total of 86 businesses included in the sample that had questions posed to them and whose replies were examined. These businesses were from a wide variety of industries, with a minor prevalence of those in the fields of manufacturing, public administration, and health care. The companies that took part in the survey ranged in size from very small (fewer than 10) to extremely large (more than 5,000), with a distribution that was unbalanced towards businesses with more than 1,000 employees. Some of the questions received replies from fewer organisations than the overall sample size simply due to the way the questions were written. The first inquiry, which aimed to elucidate the issue, focused on the occurrence of annual budget overruns for cloud expenditures, a classic sign of a lack of control over financial management.

4. RESULTS AND DISCUSSIONS

A comprehensive analysis of the findings gained from the research was presented in this section.

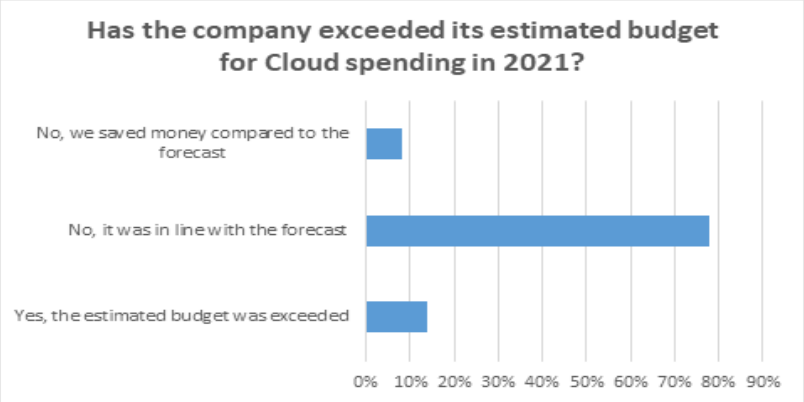

Figure 2: Cloud budget overrun

The demand for cloud services was far more than anticipated, which was frequently cited as the reason a company's budget prediction was not met. 73% of the businesses whose projections were not met offered this justification.

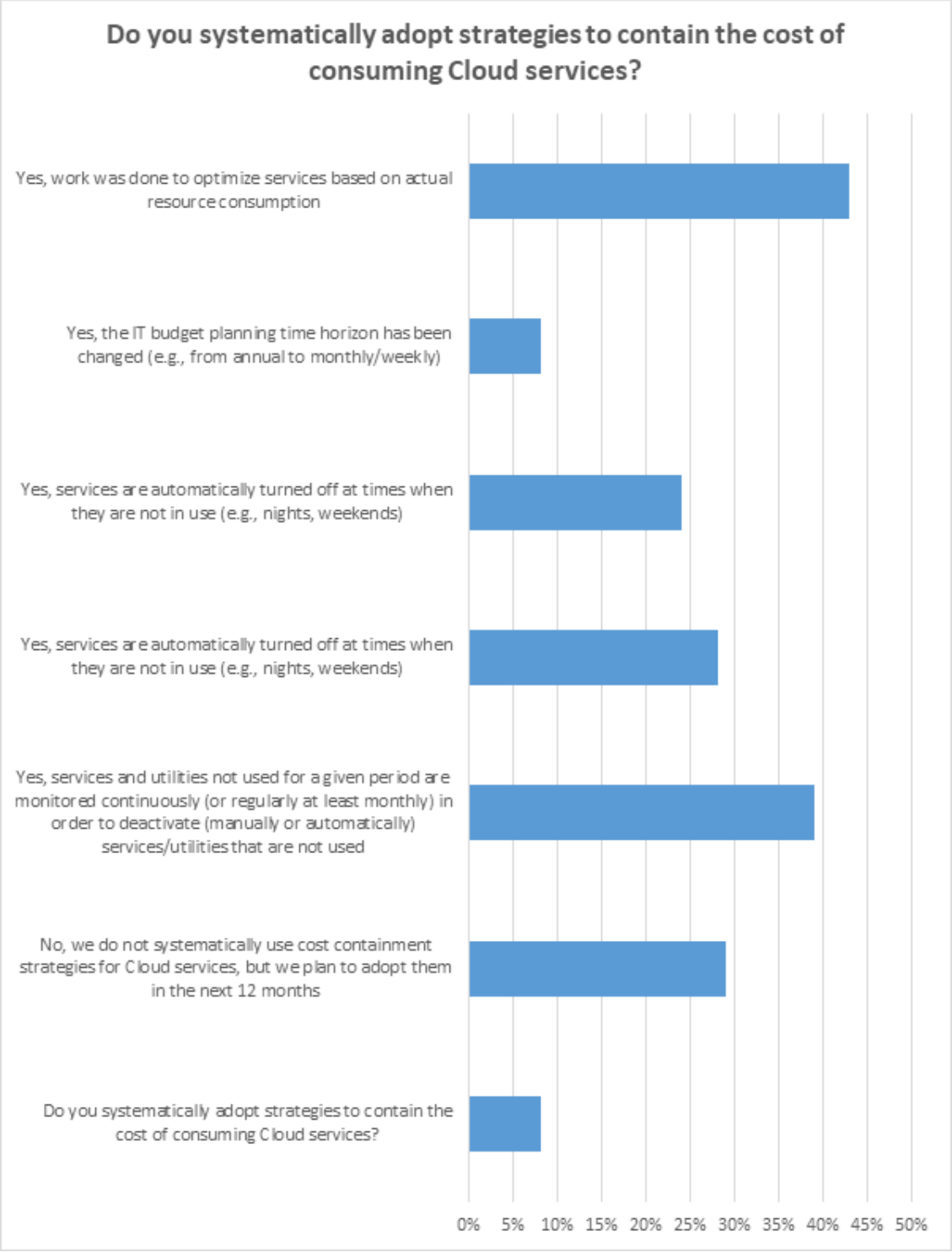

Figure 3: Cloud cost containment strategies

A question that sheds more insight on the subject will be in the section that follows. This investigation looked into how various tools, including technology, are used. Another problem that has to be brought to everyone's attention is the fact that 37% of the sample as a whole still lacks any organised methods for controlling cloud costs.

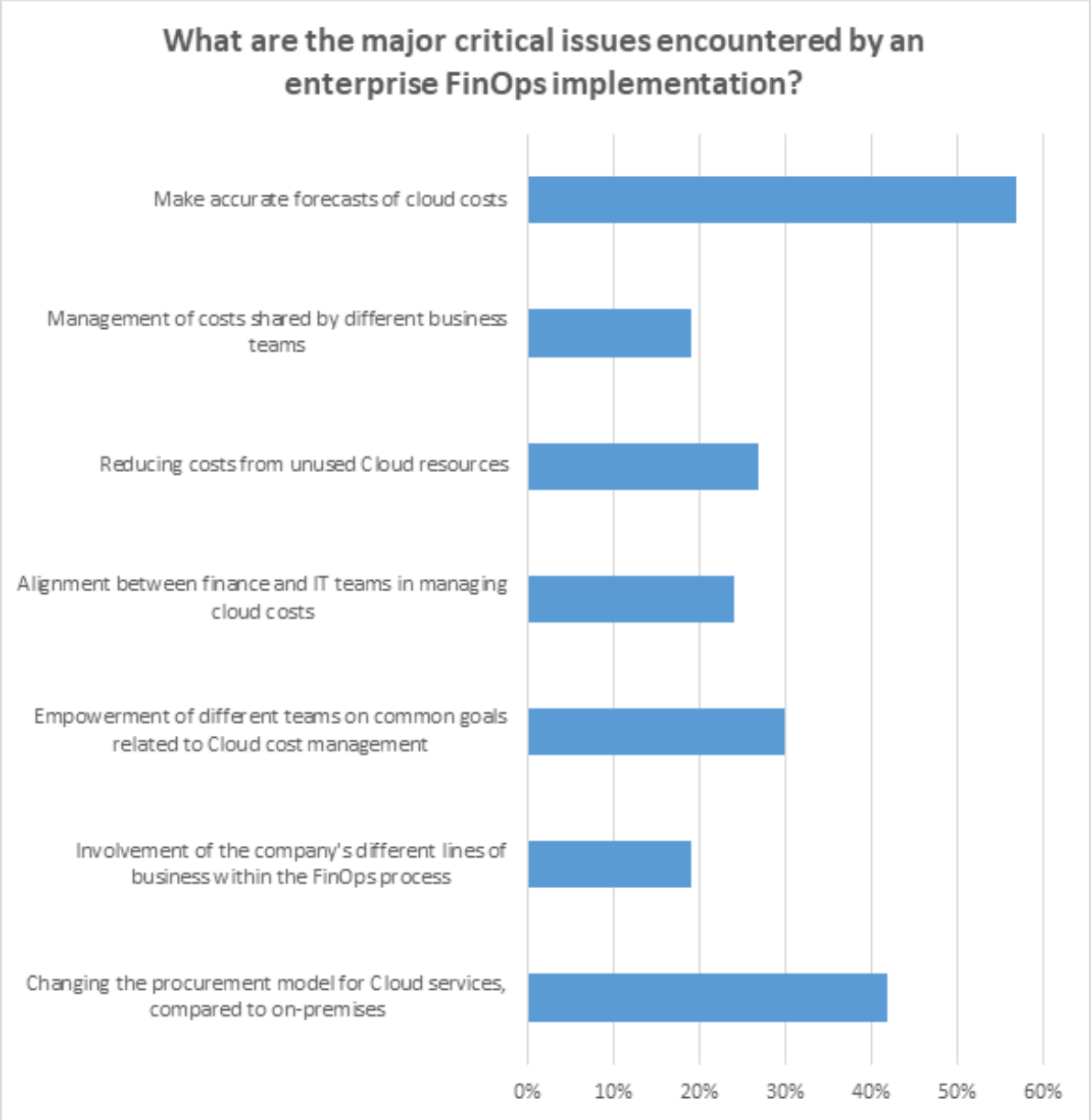

Figure 4: FinOps implementation challenges

The final question was only posed to businesses who had already implemented FinOps, and it asked them what they felt were the most crucial and urgent issues related to this subject. 42% of respondents confirmed that it is challenging to switch the procurement strategy from on-premises, and 57% of respondents concurred that it is challenging to predict with accuracy how much money will be spent in the cloud.

4.1 DISCUSSION OF THE FINDINGS

In light of this, respondents were questioned on how they were adjusting to the increased administrative and strategic challenges brought on by investments in cloud services. 43% of voters preferred resource-based service optimization. Then, resources were continuously watched to automatically shut off those that were little used (39%), shut off those with persistent patterns of non-use at particular times (28%), and set up automatic

scaling up or down mechanisms based on work (24%). Keep in mind that each of these strategies requires the adoption of Cloud cost management technology, whether it is purchased or developed internally. The data supported the claimed that shared accountability and procurement strategy for cloud spending are currently undervalued. The "in the way" and "on the side" models from Gartner illustrate how cost-controlling policies interact with pricing structures and service delivery. The majority of respondents (55%) think that continuing to centralize cost governance while also assigning all of those expenditures to IT is the best course of action. Such a design might give the impression that information technology is only a cost center rather than the engine driving a digital transformation strategy.

CONCLUSION

In conclusion, the requirements of a firm will dictate whether a corporation should use FinOps or multi-cloud billing monitoring solutions for cloud cost control. Large companies that have complex cloud infrastructures and work with multiple cloud service providers may find that multi-cloud billing monitoring is beneficial to their operations. These technologies offer specific pricing information for cloud providers. Even with these capabilities, it is necessary to use FinOps in order to cut cloud expenses and increase accountability and waste reduction. Recent research conducted by the FinOps foundation projects a 47 percent rise in the number of FinOps teams to 75 percent in the following year.

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