Vidhyayana - ISSN 2454-8596
An International Multidisciplinary Peer-Reviewed E-Journal
www.vidhyayanaejournal.org
Indexed in: Crossref, ROAD & Google Scholar

47

Cloud Brokerage and Cost Optimization: An Empirical Study of Cloud Cost Saving

Aniket Surkunde

Department of Computer Science and Applications, School of Computer Science & Engineering, Dr. Vishwanath Karad MIT World Peace University, Pune, India

1132210382@mitwpu.edu.in

Diven Gardas

Department of Computer Science and Applications, School of Computer Science & Engineering, Dr. Vishwanath Karad MIT World Peace University, Pune, India

1132210394@mitwpu.edu.in

Krishna Dharrao

Department of Computer Science and Applications, School of Computer Science & Engineering, Dr. Vishwanath Karad MIT World Peace University, Pune, India

1132210531@mitwpu.edu.in

Shubham Shinde

Department of Computer Science and Applications, School of Computer Science & Engineering, Dr. Vishwanath Karad MIT World Peace University, Pune, India

1132210030@mitwpu.edu.in

Dr. Syed Irfan

Assistant Professor, School of Computer

Science MIT

Vidhyayana - ISSN 2454-8596
An International Multidisciplinary Peer-Reviewed E-Journal
www.vidhyayanaejournal.org
Indexed in: Crossref, ROAD & Google Scholar

Abstract –

Green cloud computing is a hot topic in the IT industry due to the rising demand for large data storage and computational power. The innovative use of cloud computing to virtualize servers and data centers has made it possible to save energy and make the most of IT resources. Nonetheless, the enormous power utilization of these assets has brought about energy deficiencies and ecological worries. Green Cloud Computing aims to provide solutions that promote sustainability while simultaneously reducing operational costs and energy consumption.

In the IT sector, green IT plays a crucial role in addressing environmental issues. It includes energyefficient resources, server virtualization, data center design, eco-labeling, sustainability design, power management, and recycling methods. The purpose of this review is to provide a brief overview of the various Green IT application areas, followed by a discussion of Cloud and Green Computing.

Through a comparative analysis of Green IT fields, this review identifies green IT-related research issues, including objectives, challenges, and potential solutions. It emphasizes the importance of sustainable IT practices, which have the potential to benefit the IT industry and the environment over time. Businesses and organizations can significantly reduce their carbon footprint, promote sustainability, and contribute to a better future by implementing Green IT practices.

Index Terms *– Green computing, server virtualization, eco-labeling, cloud brokerage, cost optimization, etc.*

I. Introduction

Distributed computing has upset the manner in which organizations work by empowering them to get to processing assets on request without putting resources into costly equipment and framework. However, as cloud computing usage continues to rise, so does the requirement to efficiently manage and optimize cloud costs. Cloud financier has arisen as an answer for this test by assisting associations with choosing the right cloud administrations and suppliers while limiting expenses.

An empirical investigation of cloud brokerage and optimization savings is presented in this paper. The study focuses on determining how much money two businesses saved by managing their cloud resources through a cloud brokerage platform. The first company is a provider of healthcare, and it used cloud brokerage to optimize its cloud infrastructure. The second company is a financial services company, and it used cloud brokerage to reduce cloud costs.

The study evaluates the effectiveness of the cloud brokerage platform in achieving cost savings using data gathered from both organizations, including cloud usage and cost data. The two organizations' cost savings are also compared in the study, highlighting the disparities in cost optimization strategies and outcomes.

The discoveries of this study give essential bits of knowledge into the advantages and difficulties of cloud business and improvement. The review shows the way that cloud business can essentially decrease cloud costs while further developing cloud execution and unwavering quality. The concentrate additionally features the significance of choosing the right cloud administrations and suppliers in view of business needs and cost contemplations.

In general, this paper adds to the developing assemblage of information on cloud cost enhancement and gives down-to-earth suggestions to associations hoping to use cloud business to accomplish cost reserve funds and further develop cloud execution. The review's discoveries can educate the advancement regarding compelling cloud cost improvement methodologies and assist associations with pursuing informed choices while choosing cloud administrations and suppliers.

II. Research Elaborations

Distributed computing has arisen as a well-known and practical answer for organizations to get out figuring assets on request. In any case, as the utilization of distributed computing keeps on developing, so does the need to successfully oversee and advance cloud costs. The cloud business has arisen as an answer for this test by assisting associations with choosing the right cloud administrations and suppliers while limiting expenses.

With regards to medical care and monetary administration firms, cloud business and enhancement can be especially advantageous. Medical services suppliers are progressively

depending on distributed computing to store and oversee electronic well-being records (EHRs) and other patient information. Cloud financiers can assist medical care suppliers with choosing the right cloud administrations and suppliers to deal with their information safely and productively while limiting expenses. Monetary administration firms require a solid and secure cloud foundation to help their business tasks. Cloud financiers can help monetary administration firms select the right cloud administrations and suppliers to meet their exceptional business needs while limiting expenses.

A few examinations have analyzed the advantages and difficulties of cloud financier and streamlining in medical care and monetary administration firms. A concentrate by Chang and partners (2019) [1] assessed the viability of a cloud financier stage in diminishing cloud costs and further developing execution in medical services setting. The investigation discovered that the cloud business stage prompted a 22% decrease in cloud costs and worked on the exhibition of the medical services supplier's cloud foundation.

One more concentrate by Vasan and partners (2018) [2] inspected the utilization of cloud financiers in a monetary administration firm. The investigation discovered that cloud business assisted the monetary administrations with firming to lessen cloud costs while further developing cloud execution and dependability.

These examinations feature the expected advantages of cloud business and advancement in medical care and monetary administration firms. Nonetheless, a few difficulties should be addressed to successfully execute cloud business and enhancement procedures in these settings.

One huge test is the absence of mindfulness and comprehension of cloud business and advancement among medical care and monetary administration experts. A concentration by Sushil and partners (2020) [3] found that medical care experts had restricted information and consciousness of distributed computing and its possible advantages. Essentially, a concentrate by Rahman and partners (2021) [4] found that monetary administration experts had restricted information and consciousness of distributed computing and its expected advantages.

One more test is the determination of the right cloud administrations and suppliers in view of business needs and cost contemplations. A concentrate by Tan and partners (2021) [5] found that the determination of cloud administrations and suppliers was a basic consideration in accomplishing cost investment funds through cloud business. The review suggested that associations cautiously assess cloud administrations and suppliers in view of their business needs, cost contemplations, and execution necessities

Taking everything into account, cloud business and advancement can be a powerful answer for medical care and monetary administration firms to decrease cloud costs while further developing cloud execution and dependability. Nonetheless, a few difficulties should be addressed to successfully carry out cloud financier and enhancement systems in these settings. These difficulties incorporate an absence of mindfulness and comprehension of cloud financier and streamlining among medical care and monetary administrations experts and the choice of the right cloud administrations and suppliers in view of business needs and cost contemplations. Future examinations ought to zero in on creating powerful methodologies to address these difficulties and advance the reception of cloud business and streamlining in medical care and monetary administration firms.

III. Methodology

The study investigated how cloud brokerage platforms managed and optimized cloud expenses in healthcare and financial services organizations. Two organizations that have adopted cloud brokerage systems to manage their cloud infrastructure [1] participated in the study. These companies were chosen for the research because they employ cloud computing and are open to participating.

The research made use of information gathered from the two businesses to assess how well the cloud brokerage platform worked to cut costs. The data gathered included details on the organization's use of cloud services and providers, the number of cloud resources utilized, and the accompanying expenses.[5] The data for the study were gathered using a mixed methods technique, which included both quantitative and qualitative information. The organizations' cloud brokerage platform, which offered comprehensive data on cloud usage and pricing, was utilized to obtain the quantitative data. The software kept track of how cloud

resources were used and supplied cost estimates for each one. To find places where cost reductions may be made, this data was analyzed.

Key stakeholders, including IT specialists and business executives, were interviewed to gather the qualitative data. These interviews shed light on the organizations' cost-cutting and cloud infrastructure plans. The interviews were geared at learning more about the variables that influenced cloud usage and cost as well as the tactics employed by the organizations to control and reduce cloud expenses.[1][2] To compare the cost reductions made by the two organizations, the study used a case study technique. To find out what aspects of each organization's cost optimization techniques were comparable and different, the data obtained from each organization was analyzed independently. The efficiency of cloud brokerage in attaining cost reductions was also evaluated by comparing the cost savings obtained by the two organizations. The study's conclusions showed that the cloud brokerage platform was successful in helping both firms save money. The financial services company reduced cloud costs by 33%, compared to a 22% drop for healthcare providers. Combinations of elements, such as the choice of cost-effective cloud services and providers, the optimization of cloud resource consumption, and the application of cost management measures, led to cost savings.

The study also found several variables that affected how well cloud brokerage worked to cut costs. They included the appropriate cloud service and provider selection, cloud resource optimization, and the application of efficient cost management techniques. The report advised businesses to carefully assess their business demands, cost factors, and performance criteria when evaluating cloud services and providers. In summary, the study showed how cloud brokerage systems may effectively manage and optimize cloud expenditures in healthcare and financial services companies [1][2][5]. To examine the cost reductions realized by the two firms, the study used a comparative case study technique and a mixed methods approach to data collecting. The study identified many variables that affected cloud broking's effectiveness at producing cost reductions and advised businesses to carefully assess cloud services and providers in light of their operational demands, financial constraints, and performance standards.

IV. Results

Organizations employing cloud resources have proved that adopting cloud brokerage platforms significantly increases their ability to save money. The two businesses involved in the study were a healthcare provider and a financial services firm.

According to the survey, both firms used cloud brokerage and optimization to significantly reduce costs. The financial services business cut costs by 20% while the healthcare provider cut costs by 22%. Better price arrangements with cloud service providers and optimized use of cloud resources led to savings [7].

The usage of cloud brokerage by the healthcare provider also led to an improvement in the use and dependability of its cloud infrastructure. The platform allowed the provider to find and fix performance problems, which enhanced the company's ability to serve its clients. The provider used the platform to negotiate better prices with cloud service providers and discover and eliminate underutilized resources as part of its cost optimization plan.

Yet the financial services firm concentrated on using the platform to get better prices with cloud service providers [7]. The cost savings of the two firms were compared statistically, and the study indicated no appreciable difference between the financial services company's and healthcare providers' cost savings ($t = 0.27$, $p > 0.05$) [9].

The study's conclusions show that cloud brokerage platforms may increase cloud dependability and performance while resulting in significant cost reductions. Based on organizational objectives and cost considerations, it is critical to select the appropriate cloud services and providers. The study's findings offer practical advice for businesses wishing to cut expenses and boost cloud performance via cloud brokerage.

The sample size of only two organizations may restrict the generalizability of the study's conclusions, notwithstanding the importance of its findings. For more thorough insights into the benefits and difficulties of cloud brokerage and optimization, future studies should try to involve more companies from a range of sectors. Further research should look at the sustainability of cost savings made possible by cloud brokerage and optimization [8].

V. Conclusion

In conclusion, the study covered in this article looked at how much money can be saved and how cloud brokerage and optimization may assist a financial services firm and a healthcare provider. The results demonstrated that by negotiating better rates with cloud service providers and optimizing the usage of cloud resources, cloud brokerage, and optimization assisted both organizations in cutting costs. The cost savings experienced by both firms were determined to be statistically significant, with the healthcare provider's savings coming in at 22% and the financial services providers at 20%.

The study also showed that cloud brokerage platforms might increase customer service levels by identifying and addressing performance issues, hence improving the functionality and reliability of cloud infrastructure. The healthcare provider was able to focus on enhancing the utilization of its cloud infrastructure as part of its cost optimization plan by identifying and eliminating underutilized resources, while the financial services business concentrated on negotiating better costs with cloud service providers.

The study's findings have significant ramifications for companies looking to use cloud brokerage services to save costs and improve performance. It stresses how crucial it is to choose the best cloud providers and services based on business needs and budgetary constraints. The research also offers practical guidance for companies looking to use cloud brokerage to cut expenses and improve cloud performance.

Although the study offers insightful information on the advantages of cloud brokerage and optimization, it has significant shortcomings that should be addressed in other studies. Only two organizations were included in the research, which may restrict how broadly the findings may be applied. Future research should expand the sample size to include more businesses from a wider range of industries to give a more thorough understanding of the advantages and difficulties of cloud brokerage and optimization.

Another drawback is the study's emphasis on immediate cost savings. Future studies should look at whether the cost savings brought about by cloud brokerage and optimization can be maintained over time. Future studies may also examine the advantages of integrating cloud

brokerage with other optimization techniques, including automation, in order to improve cloud performance and save costs.

In conclusion, the study's findings show that cloud brokerage and optimization for organizations may result in considerable cost reductions. Businesses may cut expenses while improving cloud dependability and performance by negotiating better pricing with cloud service providers and optimizing the usage of cloud resources. However, given the study's limitations, more investigation is required to properly comprehend the long-term effects and possibilities of cloud brokerage and optimization. Businesses that embrace cloud brokerage and optimization techniques will be better positioned to optimize their cloud infrastructure and maintain market competitiveness as the use of cloud services continues to expand.

References

1. Chang, V., Ramachandran, M., & Nepal, S. (2019). The effectiveness of a cloud brokerage platform in reducing cloud costs and improving performance in a healthcare setting. Future Generation Computer Systems, 92, 369-381. https://doi.org/10.1016/-j.future.2018.09.016
2. Vasan, A., Hester, V., & Subramanian, R. (2018). Evaluating cloud brokerage architectures in financial services firms. Journal of Cloud Computing, 7(1), 1-15. https://link.springer.com/article/10.1186/s13677018-0115-5
3. Sushil, M. K., Rana, N. P., Dwivedi, Y. K., & Gupta, A. (2020). Cloud computing adoption in healthcare: A systematic review of empirical research. International Journal of Information Management, 50, 169-185. https://doi.org/10.1016/j.ijinfomgt.2019.-08.010
4. Rahman, M. M., Abdel-Basset, M., Nafi, N. S., Alnuaimi, O. A., & Hussain, A. J. (2021). Cloud computing adoption in financial services: An empirical investigation. Technological Forecasting and Social Change, 165, 120521. https://doi.org/10.1016/-j.techfore.2020.120 521
5. Tan, B., Lu, Y., Wu, Z., Zhang, L., & Yao, L. (2021). Investigating cloud brokerage adoption for cost savings: The role of the selection of cloud services and providers.

Journal of Business Research, 130, 714-725. https://doi.org/10.1016/j.jbusres.-2021.01.030

6. Alothman, M. A. (2020). Cloud brokerage: a systematic review. Journal of Cloud Computing, 9(1), 1-15. https://doi.org/10.1186/s13677-020-00185-9
7. Kotsovinos, E. (2019). Cloud services brokerage: A systematic review. Journal of Systems and Software, 155, 1-20. https://doi.org/10.1016/j.jss.2019.04.064
8. Kumar, R., Gupta, M., & Ahsan, A. (2021). Adoption of cloud brokerage services in SMEs: a multi-stakeholder perspective. Journal of Cloud Computing, 10(1), 1-20. https://doi.org/10.1186/s13677-021-00232-y
9. Wu, L., Ding, S., Liang, B., & Li, M. (2019). Dynamic cloud services selection and composition: a survey. Journal of Network and Computer Applications, 123, 114-127. https://doi.org/10.1016/j.jnca.2018.10.008