Cloud Computing in Big Data: Benefits and Challenges

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Abstract

- Cloud computing and big data analytics has numerous benefits for businesses when combined.

- This combination improves big data mining, network analysis, and data processing.

- Cloud computing provides essential **support** to **overcome shared computing resource challenges** in big data.

- The paper discusses the **advantages and implications of using cloud computing for big data and application development.**

- The paper highlights uncertainties and issues that may arise when using a cloud-based service model.

Shergil, A. (2019). How Big Data And Cloud Computing Can Turn Things For The Businesses?

Literature Review

- Cloud computing is crucial for big data analytics due to its **scalability and adaptability(**Yang, 2017**).**
- Cloud-based extensive data systems require scalable and fault-tolerant processing frameworks like Hadoop and Spark(Ji, 2020).
- Cloud computing can help address big data computing challenges, but s**trict oversight and regulation are necessary for privacy and security**(Liu et al,2018)**.**
- Assunço et al. (2015) examined the development and forecast of cloud computing and big data. They discussed about how cloud computing may help with the main problems associated with big data computing, such as data management, processing, and analysis.
- Different fields of study have discussed the advantages and disadvantages of cloud-based big data platforms, underlining the need for security, privacy.

Technical Details

- Offers scalability, elasticity, cost-effectiveness, and adaptability for big data analytics.

- Cloud-based big data platforms allow businesses to store and analyze large amounts of data with minimal initial investment(Jaiswal, 2018).

- The cloud computing architecture for big data processing has three layers: infrastructure, platform, and software as a service.

- Big data processing in the cloud involves capturing, storing, processing, and analyzing data.

- Cloud-based data systems provide tools and platforms for processing and analyzing large amounts of data, including data visualization and machine learning.

Risks and Limitations

- **Security** and **privacy** are primary concerns when storing data on the cloud.

- The availability and dependability of cloud resources are important factors to consider**(Yang, 2017)**.

- Legal and regulatory issues, including data ownership and jurisdiction, can arise with cloud-based big data platforms.

- Scalability and integration challenges may arise when processing large amounts of data on cloud-based platforms(Bianchi, 2015).

- Businesses should choose **scalable and elastic cloud services** and big data frameworks, such as Hadoop and Spark, to **overcome performance limitations.**

Suggestions

- Businesses must examine their current data setup, processing needs, and analytics objectives to learn how cloud computing might boost their big data capabilities(Hashem et al., 2015).

- Establishing a data governance system can help safeguard the integrity, privacy, and regulatory conformity of cloud-stored information.

- Cloud service providers can provide specialized services and apps to help businesses with their big data ambitions and give them access to cutting-edge analytics tools and technology(Akter et al., 2022).

- **Regular assessments** and **upgrades** are **essential** to optimize cloud-based big data platforms.

Conclusion

- Cloud computing and big data analytics offer numerous benefits, but also come with risks and obstacles.

- Organizations must develop a comprehensive strategy that considers their unique business requirements, compliance, and performance monitoring.

- The use of cloud-based big data systems can promote **innovation, economic growth,** and **social welfare**.

References

- Assunção, M. V., Calheiros, R. N., Bianchi, S., Netto, M. a. S., & Buyya, R. (2015). Big Data computing and clouds: Trends and future directions. *Journal of Parallel and Distributed Computing*, *79–80*, 3–15. https://doi.org/10.1016/j.jpdc.2014.08.003

- Akter, S., Michael, K., Uddin, M. R., McCarthy, G., & Rahman, M. (2022). Transforming business using digital innovations: The application of AI, blockchain, cloud and data analytics. *Annals of Operations Research*, 1-33.https://link.springer.com/article/10.1007/s10479-020-03620-w

- Jaiswal, J. K. (2018). Cloud Computing for Big Data Analytics Projects.https://www.theseus.fi/handle/10024/145896

- Ji, C., Li, Y. Y., Qiu, W., Awada, U., & Li, K. (2012). Big Data Processing in Cloud Computing Environments. *International Symposium on Pervasive Systems, Algorithms, and Networks*. https://doi.org/10.1109/i-span.2012.9

- Yang, C., Huang, Q., Li, Z., Liu, K., & Hu, F. (2017). Big Data and cloud computing:innovation opportunities and challenges. *International Journal of Digital Earth*, *10*(1), 13–53.

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