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The Comparative Study of Cloud Computing and Big Data Analytics

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Abstract: *Cloud computing and big data analytics are two key technologies driving the digital transformation of industries. Cloud computing provides on-demand, scalable resources, while big data analytics enables the processing and analysis of massive datasets to extract valuable insights. This paper presents a comparative study of these technologies, highlighting their characteristics, advantages, challenges, and integration benefits.*

Cloud computing offers various service models (IaaS, PaaS, SaaS) and deployment models (public, private, hybrid), ensuring cost efficiency and scalability. On the other hand, big data analytics is driven by the 5Vs (Volume, Velocity, Variety, Veracity, Value) and uses frameworks like Hadoop and Apache Spark. A comparative analysis reveals differences in cost, scalability, security concerns, and processing capabilities.

The study also explores how cloud computing supports big data analytics by providing a flexible and efficient infrastructure. However, challenges such as latency, data privacy, and integration complexity persist. Finally, the paper discusses future trends, including AI-powered analytics, edge computing, and quantum computing, which promise to enhance these technologies. This study provides insights into how businesses and researchers can leverage cloud computing and big data analytics for optimized decision-making and innovation.

Keywords: Cloud Computing, Big Data Analytics, Scalability, Security, AI, Edge Computing

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