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ADVANCED DATA GOVERNANCE FRAMEWORKS IN BIG DATA ENVIRONMENTS FOR SECURE CLOUD INFRASTRUCTURE

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ABSTRACT

The rapid expansion of big data technologies and cloud computing has revolutionized the way organizations store, process, and analyze vast volumes of information. However, with this growth comes an increased risk of data breaches, compliance challenges, and governance complexities. This paper presents an advanced data governance framework tailored to big data environments within secure cloud infrastructures. The proposed framework integrates comprehensive security protocols, robust data lineage tracking, and automated policy enforcement to ensure the protection of sensitive information while maintaining regulatory compliance. By leveraging machine learning and artificial intelligence, the framework enhances data quality management, improves access control mechanisms, and streamlines auditing processes. Furthermore, it addresses challenges related to the scalability and flexibility required for big data operations in the cloud, providing organizations with a strategic approach to safeguarding data integrity. The research explores best practices for implementing this framework, ensuring it adapts to evolving security threats and data governance needs, ultimately fostering trust and accountability in cloud-based big data environments.

KEYWORDS: *Advanced Data Governance, Big Data Environments, Secure Cloud Infrastructure, Data Security, Regulatory Compliance, Data Lineage, Policy Enforcement, Machine Learning, Artificial Intelligence, Access Control, Scalability, Data Integrity, Auditing Processes, Cloud Security*

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