

Navigating the Future: Trends and Challenges in Big Data and Cloud Computing

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Abstract

Big data means we're dealing with huge, fast, and complex sets of information that traditional systems can't handle well anymore. To make sense of it all, we use analytics—tools that help us find patterns and useful insights in the data. These insights can lead to better decisions and even new ways of doing business. Cloud computing makes it easier to store and work with big data because it offers flexible and scalable resources. But there's a challenge: big data systems are designed to work with separate, independent parts, while cloud systems are built around sharing and pooling resources. Making these two approaches work together takes careful planning.

When done right, combining big data and cloud computing can help companies and schools grow faster and smarter. They can learn from data and improve how they work. Still, many are worried about keeping their information safe and private in the cloud, which is why some hesitate to make the move.

This paper looks at the main features of big data, how cloud computing fits in, and what benefits and challenges come with using both together.

Keywords: Big Data, Cloud Computing, Data Analytics, 4Vs of Big Data (Volume, Velocity, Variety, Veracity), Data Integration, Privacy and Security, Distributed Systems, Resource Pooling, Hadoop