

How to Overcome Top Big Data Challenges?

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In spite of the fact that Big Data has revolutionized the industry, it faces big challenges in terms of volume, velocity, and variety. Further, there are several factors that add to the complexity of Big Data. Taking advantage of Big Data while overcoming the associated challenges requires commitment. This article answers the question, what are the problems associated with big data, and how can they be solved?

Big Data Overview

The definition of Big Data is not based on a fixed data volume. It can be relative to the organization that handles it or the people who work on it. Objectively, Big Data has the following characteristics:

Volume

Nowadays, social media, e-commerce, IoT, mobility, and other popular trends are generating a wide gamut of

information that almost all organizations have to deal with. big data can be a challenging and big dataset for an organization to handle or process.

Velocity

Those organizations generating data rapidly fall under the Big Data category, as do those dealing with popular trends mentioned above.

Variety

In an organization, Big Data is represented by various formats, such as emails, presentations, word processing documents, images, videos, and data stored in relational database management systems (RDBMS).

Big Data Challenges

Even though Big Data has become commonplace in most businesses today, the journey hasn't always been smooth. Gartner reported in 2016 that companies were sluggish right in the pilot phase. According to the study in a 2017 survey by NewVantage Partners, 48.4% of Fortune 1000 companies that used Big Data had generated any value from their investment. It is obvious that organizations face major challenges with Big Data. Let's look at some challenges they will encounter during their Big Data initiative and how some of them can be overcome.

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Data Growth

With the exponential data growth, enterprises are having trouble storing large amounts of data. Storage is one of the biggest challenges of Big Data. Images, audio files, documents, text files, etc., are often used to extract this data. It isn't easy to extract and analyze all unstructured data. These are issues related to Big Data infrastructure.

To deal with rapid data growth, converged and hyper-converged infrastructures and software-defined storage can help. Compression, tiering, and deduplication can help reduce storage costs while reducing space consumption. This issue is also addressed by companies using Big Data Analytics software, Hadoop and NoSQL databases, Spark, AI, Machine Learning, and business intelligence applications.

Data Security

One of the most daunting challenges of Big Data is security, especially for organizations with sensitive data or information about many individuals. Vulnerable data is an attractive target for cyberattacks and malicious hackers.

Organizations generally believe that their data repositories are secure enough with the right security protocols in place.

In most cases, organizations do not invest in additional security measures exclusive to Big Data, such as identity and access authority, encryption, and data segregation. The majority of organizations are more concerned with storing and analyzing data. Data security is usually ignored, which is not wise since unprotected data can quickly become a serious problem. Stolen records can cost an organization millions.

A solution to the security challenges of Big Data is as follows:

- 1- Increasing the number of cybersecurity professionals
- 2- A real-time monitoring system
- 3- Control of identity and access authorization
- 4- Security at the endpoint
- 5- Encryption and segregation of data
- 6- Security tools such as IBM Guardium can help protect Big Data

Big Data Skills

It is the job of data scientists, data engineers, and data analysts to run Big Data tools. They can handle Big Data challenges and generate valuable insights for their organizations. The problem is not the demand but the lack of such skills. Big Data salaries have drastically increased over the past few years. ZipRecruiter reports that the average annual salary of Big Data Specialists in the United States is \$107,892 as of January 2021. While organizations are investing in recruiting professionals with such skills, they are also investing in training their existing employees.

For data professionals to keep up with the rate of change in data handling tools, organizations invest in AI- or machine learning-powered data analytics solutions. By doing so, even non-experts can run tools with basic knowledge, reducing recruitment costs and achieving Big Data objectives.

Real-time Insights

It is important to note that data sets are a treasure trove of insights. However, they are of no value if they cannot provide real-time insights. Some may define real-time as instantaneous, while others may define it as the time between data extraction and analysis. However, the core idea is to generate actionable insights that will lead to efficiency in tasks like:

- 1- Launches of new products and services

- 2- Cost-savings through operational efficiencies
- 3- Creating new avenues for innovation and disruption
- 4- Promoting a data-driven culture
- 5- Increasing service deployment speed

Having timely reports and insights is one of the challenges associated with Big Data. For this reason, enterprises are looking for real-time tools to help them compete in the market.

Data Sources

In the world, everything is data. Therefore, you can imagine the possibility of generating data that aligns with the goals or objectives of any company. To create insightful reports, it is necessary to combine data from social media pages, financial reports, employee documents, customer logs, presentations, emails, etc., to create Big Data integration challenges.

Despite being often neglected, data integration is crucial to analysis, reporting, and business intelligence. Many integration tools and ETL tools are available on the market. In an IDG survey, most companies planned to invest in integration technology, which ranked second in demand after Data Analytics.

Data Validation

A Big Data scale can pose some challenges for data validation. Organizations can obtain similar data sets from various sources, but they may not always be identical. According to a 2016 survey by AtScale, data governance was the fastest-growing concern. Getting the data to agree with each other and looking out for accuracy, usability, and security fall under the category of data governance.

Data governance and Big Data management challenges are becoming increasingly complex due to all the changes in policy and technology. Special teams are assigned to manage data governance and invest in ad-hoc data management solutions to ensure data accuracy.

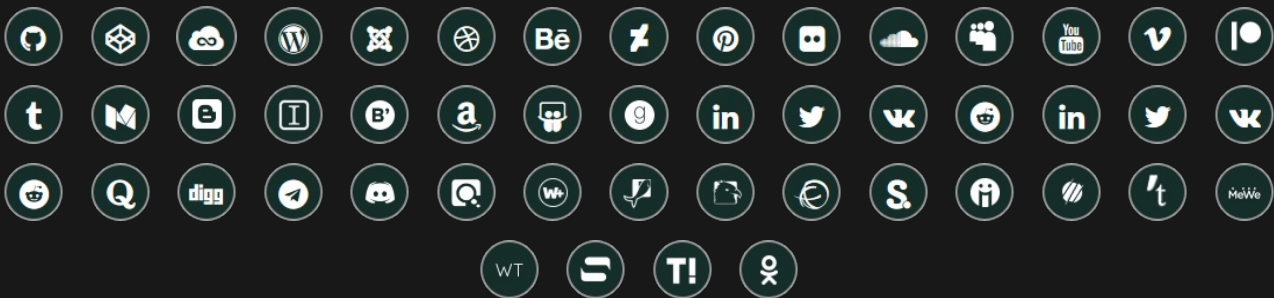
Conclusion

Keeping up with the competition is essential in today's rapidly-growing data-driven economy. Big Data challenges may arise anytime, but everyone has their approach to resolving them. As Big Data's scope is limitless, it is constantly evolving. Even experts are finding new ways around these Big Data challenges and solutions.

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