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Role of Big Data Analysis

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Abstract: With the advent of big data, businesses are now able to gather, store, and analyse enormous volumes of data in real time, bringing about huge changes in the corporate sector. For businesses looking to gain actionable insights from their data and make better decisions, big data analytics has emerged as a crucial tool. The case study of a Fortune 500 company used in this research paper illustrates how it used big data analytics to enhance its business intelligence capabilities. The study investigates the business outcomes, the company's big data architecture, and the analytics tools and methods used. The research's conclusions show how big data analytics may give businesses a competitive edge, improve consumer satisfaction, and spur business expansion. The ramifications for organisations are discussed in the paper's conclusion.

Keywords: Computer, Big Data, Analytics, Use-Cases

I. INTRODUCTION

The volume of data produced by people, companies, and machines has increased tremendously in recent years. Organisations in all industries have faced both possibilities and challenges as a result of this "big data" data boom. It has become more and more challenging to derive actionable insights from this data using conventional techniques due to the sheer amount, velocity, and variety of data. The practice of employing sophisticated analytical tools and methodologies to glean insights and value from enormous and complicated data collections is known as big data analytics. In order to handle and analyse data in real time, a variety of technologies, including machine learning, artificial intelligence, and data mining, are used. Big data analytics objectives are to assist organisations in making more informed decisions, increasing operational effectiveness.. [1-4].

History:

- The first computerized databases were developed in the 1960s and 1970s, but they were used primarily for storing and retrieving structured data.
- In the 1990s and early 2000s, the growth of the internet and digital devices led to an explosion of data, both structured and unstructured.
- This rapid growth of data made traditional data processing tools and methods inadequate, leading to the emergence of the concept of big data.
- In 2001, industry analyst Doug Laney coined the term "3Vs" to describe the key characteristics of big data: volume, velocity, and variety.
- The volume of data being generated doubled every two years, and the speed at which the data was being produced and needed to be processed was increasing.
- The variety of data being generated also increased, including text, images, and videos.
- In the mid-2000s, Apache Hadoop, an open-source software framework for distributed storage and processing of big data, was developed.
- Other big data technologies emerged, including NoSQL databases, stream processing systems, and data visualization tools.

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II. OBJECTIVE

The main objectives include here are:

a. Gain information and insights from vast and complicated data sets that can't be processed using conventional data processing techniques.
b. To make it possible for companies and organisations to decide more wisely and effectively using data-driven insights.
c. To find patterns, trends, and correlations in data that can be used to boost productivity, cut costs, and improve business operations.
d. To enhance consumer experience by tailoring goods and services based on data about individual customers.
e. To create and implement targeted marketing initiatives based on the tastes and behaviours of customers.
f. To enhance product development through analysis of user and feedback information.
g. To analyse massive amounts of data in real-time in order to identify and stop fraud and other security problems.
h. By examining inventory data, supply chain management can be improved.

III. PROCESS OF DIGITAL FORENSICS

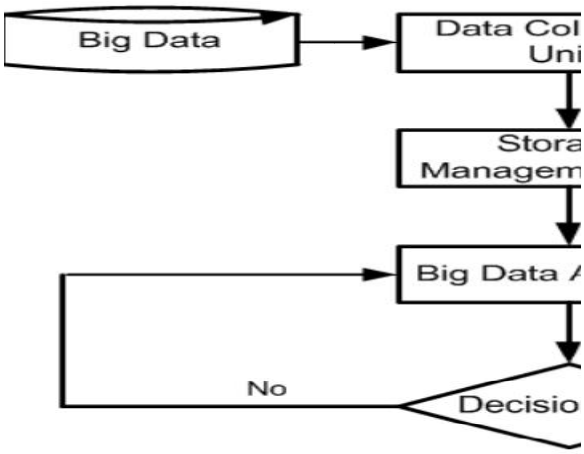

FIG : PROCESS OF BIG DATA ANALYTICS

- The following steps are involved in the big data analytics process:
- Data Acquisition: The process begins with gathering data from a variety of sources, such as internal systems, social media sites, and outside databases.
- Data Preparation: After data has been gathered, it must be ready for analysis. This entails preparing the data for analysis by cleaning it, getting rid of duplicates, adding missing information, and so forth.
- Data exploration: The data is investigated in this step to find patterns, trends, and correlations. Tools and approaches for data visualisation are often used for this.
- Data Analysis: The data is then analyzed using various statistical and machine learning algorithms to identify insights and patterns in the data. This involves applying techniques such as regression analysis, clustering, and classification.
- Data Visualisation: Following analysis, the outcomes are represented graphically using charts, graphs, and other tools. This aids in conveying the findings to decision-makers and stakeholders.
- Reporting and Decision Making: The insights and discoveries are then delivered to the decision-makers, who utilise the information to make decisions that will affect company outcomes.\Big data analytics is an iterative

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process, and each phase may be reviewed more than once to improve the analysis and the calibre of the conclusions drawn.

IV. BIG DATA ANALYTICS TYPES

- The three primary categories of big data analytics are:
- Descriptive analytics: This category of analytics involves looking at prior data to learn more about what has transpired. The main goal of descriptive analytics is to summarise and visualise data in order to spot patterns, trends, and connections. Questions like "What happened?" and "How did it happen?" are addressed using it.
- Predictive analytics: This category of analytics entails data analysis in order to forecast future events. Statistical models and machine learning algorithms are used in predictive analytics to find patterns and trends in data and create predictions. It is used to respond to inquiries like "What is likely to happen?" and "What is the likelihood that a specific event will occur?
- Each type of big data analytics has its own strengths and weaknesses, and the choice of which type to use depends on the specific business problem or question being addressed.

V. IMPORTANCEOF BIG DATA ANALYTICS

- Big data analytics are significant for a number of reasons.
- Better Decision Making: Big data analytics offers data-driven insights that assist organisations in making better decisions. Organisations can spot patterns and trends through data analysis that are hidden from view using more conventional techniques. As a result, decision-makers are able to make more informed choices that produce better results.
- Increased Productivity and Efficiency: Big data analytics may assist businesses in locating inefficiencies and operational bottlenecks, allowing them to streamline procedures and increase productivity. Profitability can rise and costs can be reduced as a result.
- Improved Customer Experience: Big data analytics allows businesses to learn more about their clients and offer tailored services based on their preferences and behaviour. Increased client satisfaction and loyalty may result from this.
- • Innovation and Competitive Advantage: Big data analytics can assist businesses in locating untapped markets and creating cutting-edge goods and services. Organisations may stay competitive and foster growth by analysing consumer and market trends.

VI. THE PART OF COMPUTERS IN BIG DATA ANALYSIS

- Big data analysis depends heavily on computers. It would be practically impossible to analyse the enormous amounts of data produced by contemporary corporate operations without the computing capacity of computers. The following are some specific ways that computers aid in big data analysis:
- • Data Storage: Databases, data warehouses, and data lakes all use computers to store substantial amounts of data. It is simpler to analyse and manage data thanks to these data storage solutions, which offer a central location for data storage and management..
- Data Visualization: Computers are used to create visualizations that help people understand and interpret data. These visualizations can include charts, graphs, and dashboards that provide insights into patterns, trends, and relationships in the data.

VII. BIG DATA ANALYSIS TOOLS

- Hadoop: An open-source system called Hadoop enables the distributed processing of big datasets across computer clusters. It is very scalable and made to handle both organised and unstructured data.

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- Spark: Spark is a distributed computing solution that is open-source and made to handle enormous amounts of data quickly. It is renowned for its capacity to manage machine learning algorithms and streaming data.
- NoSQL databases: Because they can manage unstructured and semi-structured data, noSQL databases are perfect for big data analysis. The well-known NoSQL databases MongoDB, Cassandra, and Couchbase are a few examples.
- Tableau: Tableau is a platform for data visualisation that enables users to build dashboards and interactive visualisations. It is renowned for its usability and has the ability to link to several data sources.

VIII.BIG DATA ANALYSIS CHALLENGE

- Big data analysis presents several challenges that must be addressed in order to extract meaningful insights from large volumes of data. Here are some of the key challenges of big data analysis:
- Data Quality: Ensuring that the data is correct and trustworthy is one of the main problems of big data research. Poor decision-making and wrong conclusions might result from incomplete, inconsistent, or faulty data.
- Data Integration: Big data frequently originates from numerous sources, each of which may have a distinct structure and/or format. The process of integrating this data can be difficult and time-consuming, requiring specialised equipment and knowledge.
- Data Security: Sensitive information, such customer or financial data, is frequently present in big data. To safeguard individual privacy and the organization's reputation, it is essential to ensure the security of this data.
- Scalability: Big data analysis calls for the speedy and effective processing of enormous amounts of data. Talent Gap: Big data analysis calls for specialised knowledge and abilities in fields like statistics, machine learning, and data science. Because of the lack of qualified workers in these fields, it is challenging for organisations to establish and sustain efficient big data analytics teams.
- Cost: The infrastructure and tools needed for big data analysis can be expensive to build and maintain. Smaller organisations or those with tighter budgets may find this to be a challenge.

IX. ADVANTAGES OF BIG DATA ANALYTICS

- For businesses trying to glean insights and value from massive amounts of data, big data analytics provides a number of benefits. Some of the main benefits of big data analytics include:
- Better Decision-Making: Big data analytics gives businesses access to insights and trends that help them make more educated choices. Organisations can spot trends, correlations, and patterns by analysing massive amounts of data that would not be obvious from smaller datasets.
- Improved Customer Understanding: By examining consumer behaviour and preferences, big data analytics can help businesses better understand their customers. The usage of this data can enhance goods and services, personalise marketing initiatives, and boost client happiness.Increased Operational Efficiency: Big data analytics can help organizations identify inefficiencies and bottlenecks in their operations. This information can be used to optimize processes, reduce costs, and improve overall efficiency.
- Competitive Advantage: Big data analytics can provide businesses an edge over rivals by revealing information and insights that they may not otherwise have. Organisations can improve consumer experiences, foster innovation, and make better decisions by utilising big data analytics.
- Better Risk Management: By spotting possible dangers and weaknesses, big data analytics can assist organisations in better managing risk. Develop risk mitigation plans, enhance compliance, and boost security with this information.

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X.DISADVANTAGES OF BIG DATA ANALYTICS

- Big data analytics has a lot of benefits, but there are also some possible drawbacks and difficulties that could arise. The following are some of the major drawbacks of big data analytics:
- Cost: Setting up and maintaining big data analytics infrastructure and tools can be expensive and call for large expenditures on hardware, software, and labour.
- Complexity: Analysing big amounts of data can be difficult and complex, requiring technical knowledge and specialised experience. As a result, there may be a talent gap when businesses find it difficult to locate or retain employees with the requisite training and expertise.
- The collection, storage, and analysis of enormous amounts of data can present risks to data security and privacy. Organisations must always safeguard data from leaks, cyberattacks, and unauthorised access.
- Bias: When the data sources are insufficient or biassed in and of itself, big data analytics are more prone to bias. This may result in biassed judgements and incorrect conclusions.

XI. CONCLUSION

In conclusion, big data analytics has completely changed how businesses derive value and insights from massive amounts of data. Numerous benefits are offered, including better decision-making, higher customer comprehension, increased operational efficiency, competitive advantage, and improved risk management. Big data analytics may also come with significant drawbacks and difficulties, including costs, complexity, issues with data security and privacy, prejudice, and ethical dilemmas. Organisations must carefully assess their strategy, invest in the required infrastructure and expertise, and take measures to avoid any difficulties and ethical ramifications if they are to maximise the advantages of big data analytics while minimising the risks. Big data analytics has the ability to revolutionise businesses and whole sectors, spurring success, innovation, and growth.

REFERENCES

[1]. "Big Data Analytics: A Literature Review Paper", by Manpreet Singh and Arshdeep Bahga. This paper provides an overview of the history, process, types, tools, and challenges of big data analytics.
[2]. "Big Data Analytics for Healthcare: A Review" by Mohammed M. Alshehri et al. This paper discusses the importance and applications of big data analytics in healthcare.
[3]. "Big Data Analytics: A Framework for Unstructured Data Analysis" by Subashini and Kavitha. This paper presents a framework for analyzing unstructured data using big data analytics.
[4]. "The Impact of Big Data Analytics on Business Strategy" by Adrian Savoiu. This paper discusses the advantages and challenges of big data analytics in business strategy.
[5]. "Big Data Analytics: A Survey" by Vivek Sharma et al. This paper provides a comprehensive survey of the state of big data analytics, including its applications, challenges, and future directions.