"A STUDY ON BIG DATA ANALYTICS AND ITS APPLICATIONS"

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Abstract

In the Information era, enormous amounts of data have become available to decision makers. Big data refers to huge datasets and also high in velocity and variety, which makes them difficult to handle using traditional techniques. Due to the rapid growth of such data, solutions need to be studied and provided to handle and extract knowledge data from these datasets.

Decision makers need to gain valuable insights from such varied and rapidly changing data, driven from daily transactions to customer interactions and social network data. Such value can be provided using big data analytics.

This paper aims to analyze some of the different analytics methods which can be applied to big data, as well as the opportunities provided by the application of big data analytics in various decision domains.

KEYWORDS:

Big data, Big Data Analytics, Descriptive Analytics, Predictive Analytics, Prescriptive Analytics, stages in prescriptive analysis, Analytical approaches in big data.

INTRODUCTION:

Big data is **a collection of massive and complex data sets and data volume that include the huge quantities of data, data management capabilities, social media analytics and real-time data**. Big data analytics is the process of examining large amounts of data. There exist large amounts of heterogeneous digital data. Big data is about data volume and large data sets measured in terms of terabytes or peta bytes.

The sheer volume, variety, velocity and veracity of such data is termed as "Big Data". Big data is structured, unstructured, semistructured or heterogeneous in nature. Traditional data management, warehousing and analysis systems fizzle (bust) to analyze this type of data. Due to its complexity big data is stored in distributed architecture file system. The process of capturing or collecting big data is known as "datafication".Big is "datafied" so that it can be used productively.

Big Data Analytics specifies the ways to conduct business in many ways so that it improves decision making and business process management etc.Business Analytics uses the data and different other techniques like IT, Statistics and quantitative methods to provide the results. There are three main types of Business Analytics

1. Descriptive Analytics.

2. Predictive Analytics.

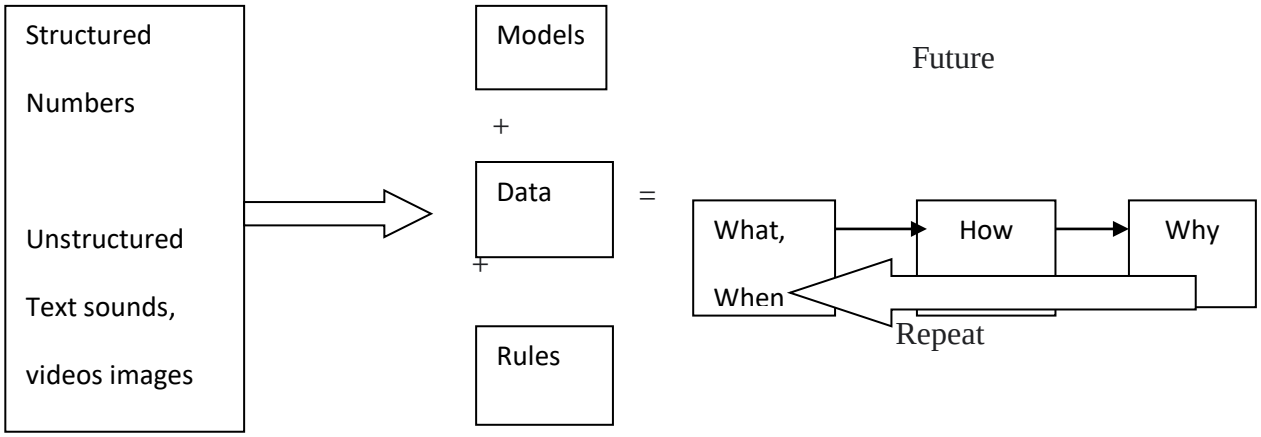
3. Prescriptive Analytics.

1. Descriptive Analytics: It is the most common form of analytics and serves as a base for advanced analytics. It answers the question “What happened in the Business?".It analyses a database to provide information on the trends of past or current business events that helps the managers and leaders to develop the future action. It performs an in -depth analysis of data to reveal details such as frequency of events, operation costs and underlying reasons for failures. It helps in identifying the root causes of the problem.

2. Predictive Analytics: It is about understanding and predicting the future and answers the question “What could happen?" by using statistical models and different forecast techniques. It predicts the future probabilities and trends and helps in "What if analysis" . In predictive analysis we use statistics and machine learning to analyze the future.

3. Prescriptive Analytics: It answers "What should we do?" on the basis of the data obtained from descriptive and predictive analysis. By using optimization techniques, prescriptive analytics determines the finest substitutes to minimize or maximize equitable finance and marketing areas. For example, if we have to find the best way of shipping goods from a factory to destination, to minimize cost we use prescriptive analysis.

The following diagram represents the stages involved in prescriptive analysis:



Prescriptive Analytics:

Data which is available in abundance can be streamlined for growth and expansion in technology as well as business. When data is analyzed successfully it can become the answer to the most important questions: how can businesses acquire more customers and gain business insights? .The key to this problem lies in being able to source, link, understand and analyze data.

The following are the common analytical approaches that businesses apply to use Big Data:

Approach	Evaluation
Predictive Analysis	• How can a business use available data for predictive and real time analysis? • How can a business avail benefits from unstructured data? • How can a business support new types of data such as social media and multimedia data?

Behavioral Analysis	• How will a business support complex data in order to create new models for : 1.Driving business outcomes 2. Decrease in business cost 3.Creating innovation in business strategy 4.improving customer overall satisfaction 5.Converting audience to customer
Data Interpretation	• What new business analysis can be estimated from the available data • Which data should be analyzed for new product innovation

ADVANTAGES OF BIG DATA ANALYTICS:

The real power of Big Data lies in its analysis.Processing,studying,and implementing the conclusions derived from the analysis of big data helps to collect accurate data, take timely and more informed strategic decisions, target the right set of audience and customers, increase benefits and reduce wastage costs.

The right analysis of the available data can improve major business processes in various ways. For examples in a manufacturing unit, data analytics can improve the functioning of the following processes:

Procurement: To finds out which suppliers are more efficient and cost-effective in delivering product on time

Product development: To draw insights on innovative product and service formats and design for enhancing the development process and coming up with demanded products.

Manufacturing: To identify machinery and product variations.

Distribution: To enhance the supply chain activities and standardize the optimal inventory level on various external factors such weather, holidays and economy etc.

Marketing: To identify which marketing technique will be most effective in driving and engaging customers.

Price management: To optimize prices based on analysis of external factors.

Merchandising: To improve merchandise breakdown on the basis of current buying patterns and increase inventory levels and product interest on the basis of customer behaviors.

Sales: To optimize assignment of sales resources and accounts and other operations.

Store Operations: To adjust inventory levels on the basis of predicted buying patterns, study of weather, key events and other factors.

Human Resources: To find the characteristics and behaviors of successful and effective employees.

Transportation: Big Data has greatly improved transportation services. The data containing traffic information is analyzed to identify traffic jam areas. Based on this analysis, suitable steps can be taken to keep the traffic moving in such areas. Distributed sensors are installed in handheld devices on the roads and on vehicles to provide real time traffic information.

Education: Big Data has transformed the education processes through innovative approaches such as E-Learning for teachers to analyze the student's ability to comprehend and thus provide education effectively in accordance with each student needs. The analysis is done by studying responses to questions, recording the time consumed in attempting those questions and analyzing other behavior signals of the students.

Travel: Travel industry also uses Big Data to conduct business. It maintains complete details of all the customer records that are then analyzed to determine certain behavioral patterns in customers.

For Example, in airline industry Big Data is analyzed for identifying personal preferences or spotting which passenger like to have window seat and path seats for flights. This helps airlines to offer the similar seats to customers when they make fresh booking with airways.

Big Data also helps airlines to track customers who regularly fly between regular routes so that they can make right cross sell and up sell offers.

Government: Big Data plays an important role in almost all the undertaking and processes of the government. Analysis of Big Data promotes clarity and transparency in various government processes and helps in

1. Taking timely and informed decisions about various issues.

2. Identifying loop holes in the processes and taking the preventive measures on time.

3. Accessing the areas of improvement in various sectors such as education, health, defense and research.

4. Using budgets more judiciously and reducing unnecessary wastage and cost.

Healthcare: In healthcare, the pharmacy and medical device companies use Big Data to improve their research and development practices. Health insurance companies use Big Data to determine the patients specific treatment therapy modes for best results.

Telecom: The mobile revolution and internet usages on mobile phones have lead to a tremendous increase in the amount of data generated in telecom sector. Managing this huge amount has almost become a challenge for the telecom industry. Big data analytics allows telecom industries to utilize this data for extracting meaningful information that could be used to gain crucial business insights that helps industries in enhancing their performance, improving customer services and business opportunities.

Conclusion:

Big Data Analytics can help businesses to make better decisions by providing insights that can be used to understand historical trends and predict future outcomes. Big data Analytics can help organizations interact with customers better, offer more personalized services, and provide better products.

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