

Big Data and Its Business Impacts for Research Paper

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Abstract

As a result of massive access to customer information from various resources such as social media sites, business organizations worldwide are trying to get the benefits from accessing this information and processing them in a manner that helps to excerpt and progress the most worth full concepts. Big data technology is one of the eminent and crucial trends known for storing and processing and even analyzing information. Organizations are extracting information so that they can use it in other levels and applying the knowledge of information technology to shore precise, unwavering business research that guides decision makers and to scrutinize outputs and business approaches. The big data trend generally helps organizations to reach up to decisions within the stipulated timeframe, and the big data trend can direct an innovative transformation in business research, intermediation and even commercial marketing. This research paper highlights the significant aspects of Big Data and the influence it has on organizational business processes including how various industries utilize the eminent open source platforms like Hadoop to process information.

Introduction

Big data has become the most eminent experience for the past ten years, with organizations like Google, eBay, Yahoo, Facebook and even twitter showing greater concern for it. It is characterized by high volume and velocity, high information assets, and quick processing. Big data analytics coincide with other types of data analytics like Hadoop, which is software that specifies large data types and operates alongside IBM mainframes. Companies tend to start by a business idea for big data analytics after which they detect which type of data analytics meet their demands. Big data has been able to offer practical solutions to problems like crimes, health care issues, and other challenges by facilitating large volumes of data or even conducting complex operations electronically. Companies such as Disney land and Amazon have been able to use big data to predict customer preferences and present them to customers. Big data has created curiosity in business intelligence, and organizations can gain the most value from it when employees are willing to explore their analyses. IT departments are shifting their roles from serving to enhancing models, and everyone is trying to gather and analyze big data.

^[1] **Big Data in Business**

The term "Big Data" refers to infinitely large volumes of unprocessed and processed data gathered from various sources and utilized by businesses for some profitable purpose. Since a more precise definition cannot be given, let's concentrate on another frequently asked question: "How is Big Data used in business?" Regardless of the specific industry in which it is used, the ultimate business impact of big data is an increase in profits through data collection, processing, and utilization of analyzed information. It's crucial to realize that Big Data alone might not be enough to reap significant, long-lasting benefits and that it performs much better when combined with AI, ML, cloud services, and other potent Data Science solutions.

^[3] **How does Big Data Impact Businesses ?**

Every action and interaction that takes place online is gathered and processed to produce as much insight as possible. With the help of this information, customers' online profiles can be developed and reveal a lot about a customer's personality, behavior, and life events. "Businesses that use big data reported 8 percent increased profits and a 10 percent reduced overall cost." Big Data can generate fresh concepts for business development. With real-time analysis, Big Data's impact on businesses can be even more profitable than ever. Here are some advantages of implementing big data analysis in your business.

Targeted Marketing Big Data analysis produces extremely precise targeted marketing campaigns, enabling businesses to tailor their efforts to the needs of their targeted customers. A helpful analysis can aid in predicting what goods or services customers might require in the future. With such information, it is much simpler to make advertisements for specific products that are more tailored.

Proactive Customer Care Thanks to big data analysis, you can anticipate your customer's needs before they start the purchasing process. Companies can fully comprehend the needs of their customers through real-time analysis of data gathered from various channels, such as social media, in-store visits, or browsing history.

Efficiency Improvements Big Data enables businesses to fully comprehend their products, allowing for the optimization and modification of decision-making procedures to ensure the highest possible operational efficacy. Operational and historical data gathered from various sources, including machine logs, social media, the web, or apps, can be transformed into evident and usable insights that can also be used as an opportunity for improvement.

Business Security Security breaches may significantly decline due to the implementation of Big Data in operations. Big Data tools make it simple to identify all malware and ransomware attacks. They reduce the time needed to locate and address threats, enable IT to anticipate future attacks, and limit or even prevent damage.

Revenue Growth New product development can benefit from big data. Companies can start partnerships with third parties to share aggregated data or use the gathered insights to assist their clients in addressing their Big Data challenges. To target their customers with customized offers, some retailers, for instance, may be interested in location-based data from telecommunication companies.

Up-selling and Cross-selling Personalization offers a fantastic way to upsell goods. Big Data analysis compiles all customer data in one location, allowing for individualized recommendations to even new clients. This way, they are more likely to find what they want and buy more goods.

^[4]**How Bid Data is used in Businesses Across Industries**

Financial services ,retail, e-commerce, manufacturing, and telecommunication are some of the leading industries using big data solutions. Business owners are increasingly investing in big data solutions to optimize their operations and manage data traffic. Vendors are adopting big data solutions for better supply chain management.

Banking , Financial Services and Insurance The BFSI sector extensively implements big data and analytics to become more efficient, customer-centric, and, thus, more profitable. Banks and retail traders use big data for sentiment measurement and high-frequency trading, among others. The sector also relies on big data for risk analytics and monitoring financial market activity.ir clients.

Retail The retail sector collects data using RFID (Radio Frequency Identification), POS (Point of Scale) scanners, customer loyalty programs, and other technologies. Big data usage helps to decrease fraud and makes it possible to analyze inventory in real-time.

E-commerce The importance of big data for E-commerce business is clear enough: the more you know about your customer, the more profits you generate from your e-store. Data on real-time customer behaviour, purchasing history and products liked allow tracking high-demand products and forecasting trends to be the first in the market to introduce best-selling products. Pricing analysis, inventory management, customer churn prediction – these are only a few more things the technology can do for business. The key to success is to be able to offer an extraordinary customer experience that makes customers pay a higher price and this is where the technology becomes your business partner.

Manufacturing This industry generates a significant amount of untapped data. The sector faces several difficulties, including labor shortages, complex supply chains, and equipment failure. Businesses can find new ways to reduce costs and enhance product quality using big data.

Logistics , Media amd Entertainment Big data in the logistics industry assists online retailers in managing inventory in accordance with issues unique to one or more locations. Companies in this industry use big data to analyze personal and behavioral information about customers to develop detailed customer profiles.

Oil and Gas Big data aid decision-making in the oil and gas industry. An in-depth geometry analysis can help businesses decide where to put wells. Agencies also use big data to ensure that their safety precautions are adequate. Big data is starting to be used more and more by businesses. They use analytics and other technologies for effective data management, keeping in mind the advantages of big data for businesses. However, the adoption of big data in several sectors, including healthcare, oil & gas, and others, has been sluggish. The technology is expensive, and many businesses still do not use most operational data.

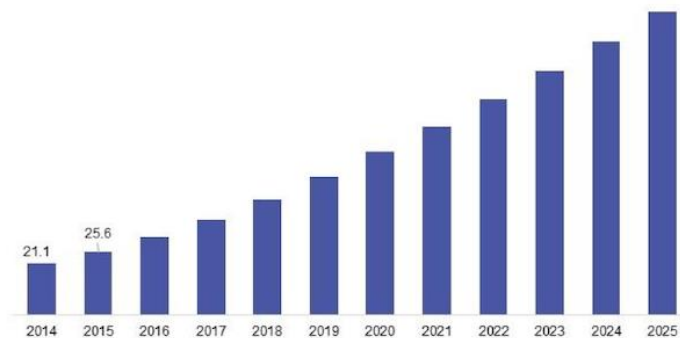


Fig 1 Big data market , 2014-2025

Challenges of Big Data

Big data is an important topic that must be addressed in order to gain an understanding of its impact. Business organizations should implement the appropriate talents and technology together with supplementary workflow outlines alongside incentives to enhance the application of big data. Access to information is a crucial concept, and organizations should integrate information from various sources of data. The biggest challenge for implementing big data analytics is to fragment helpful information from groups. Additionally, there is a deficiency of capable staff who have the right stuff to bode well out of huge information. Data storage techniques have changed over the years to accommodate the rapid changes in data, but suppliers of databases are still struggling to cope with massive volumes of information.

^[2] Algorithm

- Linear regressions can be used in business to evaluate trends and make estimates or forecasts. Equation $Y = a + bX$, where Y is the dependent variable (that's the variable that goes on the Y-axis), X is the independent variable (i.e. it is plotted on the X-axis), b is the slope of the line and a is the y-intercept.
- Logistic regression is a statistical analysis method to predict a binary outcome, such as yes or no, based on prior observations of a data set. A logistic regression model predicts a dependent data

variable by analyzing the relationship between one or more existing independent variables Equation $P(x) = \frac{e^{(b_0+b_1x)}}{1 + e^{(b_0+b_1x)}}$

- K-Means Clustering basically means dividing the data set into groups of similar data items called **clusters**. K means clustering categorizes the data items into k groups with similar data items. Equation $D = \sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}$
- Naive Bayes algorithm helps in building predictive models. We use this Data Science algorithm when we want to calculate the **probability** of the occurrence of an event in the future. Equation $P(A|B) = \frac{P(B|A) P(A)}{P(B)}$

[4]Methodology

This study investigates the use of Big Data Analytics by examining the technological fit, organization fit, used in this study to test the theoretical model consisted of two parts: the first part included demographic annual sales, and adoption status of Big Data Analytics services; the second part included questions measuring Data, the research model consisted of 11 constructs as shown in table1. Telecom were chosen because according to Everest research, the adoption of analytics by these sectors accounts the target participants of this study were those using Big Data. Most of the responses were collected through personal visits to the respondents.

Table 1: Categorization of firms with respect to size

Category	No of Employee	No of Organizations
Small	No of Employee <400	87
Medium	Medium 400<=no of Employee<=800	98
Large	No of Employee>800	105

Table 2: Categorization of firms with respect to turnover

Organization Type	No of Organizations
CPG and Retail	97
Healthcare	56
Banking	76
Telecom	61

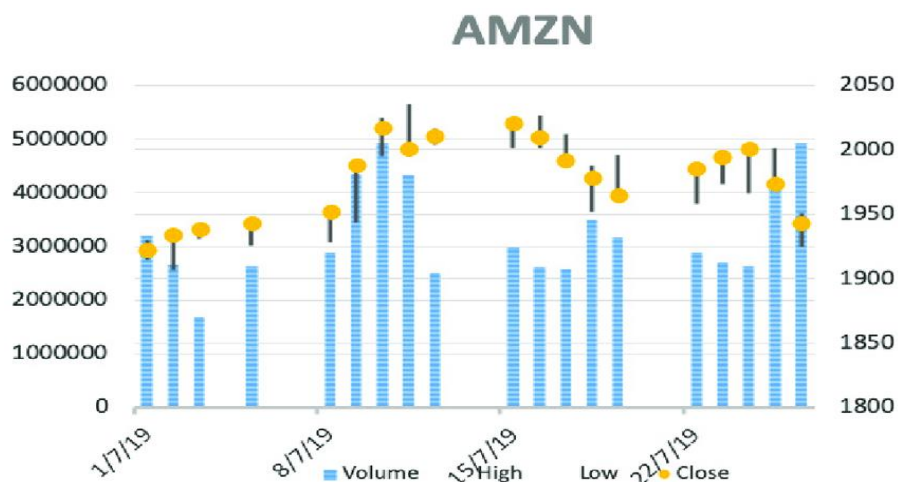
Table 3: Challenges sales and marketing

Challenges	2021	2022
Lack of accurate/shared data on target accounts and prospects	43%	27%
Communication	43%	49%
Measured by different metrics	41%	40%
Processes are broken /flawed	37%	43%
Lack of accountability on both sides	25%	27%

[3,1] Real- world Examples of How Businesses use in Big Data

Amazon

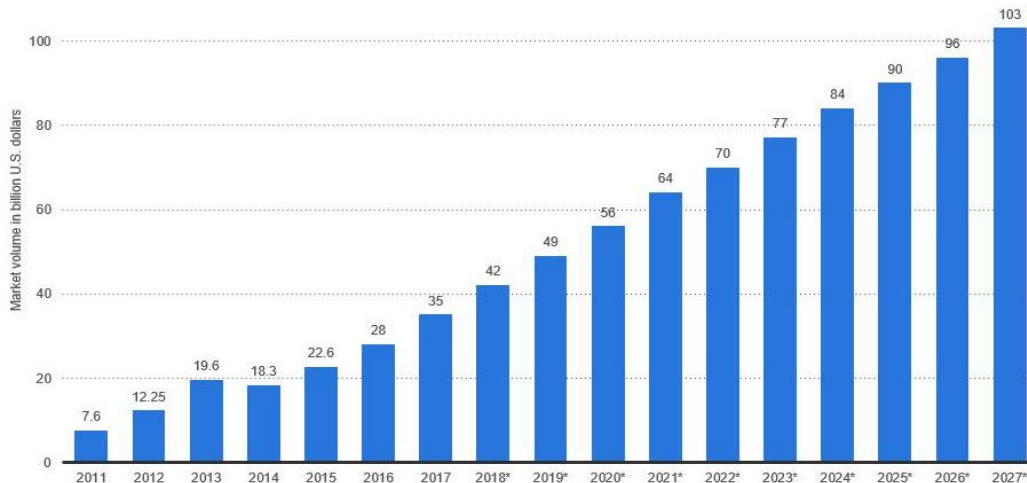
To track how customers spend their money on a particular product, they keep track of every piece of information about each customer. All of this data is being gathered for use in social media advertising algorithms, which can then be used to improve customer experience and services, develop stronger customer relationships, and recommend products. You may have noticed, for instance, that when you add something to your wish list or shopping cart, it suggests additional items you might like or displays items you may have purchased along with that item. In this way, Amazon uses big data to leverage recommendations to facilitate quick customer purchases and improve the shopping experience.



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Google

Google analyses big data to determine what we need from it based on various factors, including search history, locations, trends, and a host of other factors. Google conveniently displays the top-ranked search results tailored to the user's requirements in terms of authority and relevance.



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Conclusion

Big Data Analytics in industrialization methodology can advance agility and industrialization implementation. It can help businesses anticipate unusual things and overhaul process performance, leading to cost decrease, best operational plan, lower levels of inventory, best hierarchical work drive, and enhancements in activities productivity. Big data analytics capability and hierarchical components can accelerate the exploitation of big data analytics in operations.

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