# BIG DATA IN BUSINESS

**Article** · January 2018

DOI: 10.23956/ijarcsse.v8i1.543



**1 author:**

Philip Adebo
Prairie View A&M University
**10** PUBLICATIONS **50** CITATIONS

*International Journals of Advanced Research in Computer Science and Software Engineering*
*ISSN: 2277-128X (Volume-8, Issue-1)*

**Research Article** | **January 2018**

# Big Data in Business

**Matthew N. O. Sadiku, Philip O. Adebo and Sarhan M. Musa**
*Roy G. Perry College of Engineering, Prairie View A & M University, Prairie View, TX77446, United States*
Email: sadiku@ieee.org; philip.adebo@gmail.com; smmusa @pvamu.edu

***Abstract:*** ***Business has always desired to derive insights from big data in order to make better, smarter, data-driven decisions. Big data refers to data that are generated at high volume, high velocity, high variety, high veracity, and high value. It has fundamentally changed the way business companies operate, make decisions, and compete. It can create value for businesses. This paper provides a brief introduction to how big data is being used in businesses.***

***Key words: big data, big data analytics, business, data scientists***

## I. INTRODUCTION

Data is unexpectedly everywhere. It is a major success factor influencing quality decision making. Data streams from daily life: from cell phones, tablets, emails, ecommerce, sensor-equipped buildings, machine-to-machine or IoT, factories, smart grid, ehealth records, genomics, professional sports, weather sensors, social networks, just to name a few. This leads to an explosion of data.

Business or commerce is the major source of data in the global marketplace, businesses, distributors, and customers generate vast amounts of data. Nowadays, it is rare to find a business that is not generating data. Service supply chain such as finance, banking, insurance, tourism, and telecommunications drive big data (BD). In business, big data may be considered as cost-effective techniques for solving business problems whose resource requirements exceed the capabilities of traditional computing environment. Big data offers competitive advantage to a company in that it allows the company to outperform its competitors. Applying big data in business can enhance efficiency and competitiveness in many aspects such as marketing, banking, supply chain, and e-commerce. BD has emerged as a vital means for enhanced business activities, better execution of operations, and improved marketing strategy. Without doubt, BD is making a positive impact on the business sector [1].

## II. BIG DATA OVERVIEW

Big data refers huge data which cannot be processed by the conventional database system. While most traditional data sources are structured, big data may be structured, semi-structured, or unstructured. BD is often characterized by the five "Vs": volume, velocity, variety, veracity, and value [2].

- *Volume*: This refers to the size of the data being generated both inside and outside organizations and is increasing annually. Some regard big data as data over one petabyte in volume. The volume of data available today is measured in zettabytes (ZB), which is equal to 1 trillion gigabytes (GB).
- *Velocity*: This depicts the unprecedented speed at which data are generated by Internet users, mobile users, social media, etc. Data are generated and processed in a fast way to extract useful, relevant information. Real-time information makes it possible for a company to be much more agile than its competitors.
- *Variety*: This refers to the data types since big data may originate from heterogeneous sources and is in different formats (e.g., videos, images, audio, text, logs). BD comprises of structured, semi-structured or unstructured data. Mobile phones, ecommerce, GPS, and social media all generate torrents of data daily.
- *Veracity*: By this, we mean the truthfulness of data, i.e. whether the data comes from a reputable, trustworthy, authentic, and accountable source. It suggests the inconsistency in the quality of different sources of big data. The data may not be 100% correct.
- *Value*: This is the most important aspect of the big data. It is the desired outcome of big data processing. It refers to the process of discovering hidden values from large datasets. It denotes the value derived from the analysis of the existing data. If one cannot extract some business value from the data, there is no use managing and storing it.

On this basis, small data can be regarded as having low volume, low velocity, low variety, low veracity, and low value. Big data analytic techniques are used in analyzing BD. They include data mining, web mining, machine learning, social network analysis, visualization methods [3].

 

## III. APPLICATIONS

Big Data has the potential to create a lot of new growth opportunities. It is applied in various areas such as IoT, transportation, smart grid, eHealth, government, and public utilities. In the business sector, BD can be applied in the following areas [4]:

- *Marketing:* Marketing has become a field for experiments with BD approaches. Decision making is a key issue for marketers. Big data analytics has emerged as a pivotal trend to answer the challenges of BD in marketing. It provides insights to assist in answering critical questions such as what is the most suitable product for a specific market and how to advertise such product in the market [5].
- *Financial Industry*: Big data has rapidly become an obsession with entrepreneurs, scientists, governments and the media. Banking can benefit from BD from various sources such as financial forecasting, portfolio management, and asset pricing.
- *Insurance*: This segment can benefit from BD through risk analysis of customer and pricing optimization.
- *Consultancy:* Some companies are not capable of performing their own data analysis. Others lack the expertise required to tackle their big data problems. This has given rise to an industry of firms, such as IBM, that provide consultancy and expertise [1].

Other areas include cell ecommerce, phone companies, and business intelligence,

## IV. BD BENEFITS

Here are just some of the ways that big data is changing business [6].

1. *Better Decision:* All business managers are constantly required to make critical decisions and it is well known that data-driven decisions tend to be better decisions. Every business organization, whether small or large, needs valuable data and insights to make strategic and operational decisions. With BD, business managers can measure and therefore manage more precisely than ever before. They can make better predictions and smarter decisions.
2. *Better Business Intelligence*: Business intelligence is a set of data tools that go hand in hand with big data. Big data has given rise to business intelligence as a legitimate career. Business executives seek to glean intelligence from big data and translate that into business advantage.
3. *Targeted Marketing:* Big data enables businesses to create targeted marketing campaigns. Although big data analysis is not always perfectly accurate, it can be highly accurate Big data analysis can help business predict what products customers might need in the future.
4. *Efficiency Improvements***:** Engineers are using big data to make processes run more efficiently. Big data is providing rich data about every product and process. Big Data can create a lot of new growth opportunities.
5. *Reduce Costs*: Businesses understand that operational processes benefits by cost reduction, best operations plan, and lower inventory levels. Big data has the potential to supply the necessary information to reduce business costs. It can help planners determine when to produce, how much to produce, and how much inventory to keep on hand.

Businesses integrating big data and using it to boost their brand success include Amazon, American Express, General Electric, IBM, UPS, Police Departments, Oracle, Capital One, Netflix, Starbucks, and T-Mobile. Organizations that are built around BD include Google, eBay, Facebook, and LinkedIn [7].

## V. CHALLENGES

While the promise of data-driven decision making is now widely recognized, there is presently a wide gap between its potential and its realization. The main challenges of big data analytics fall in the domains of technology, people, and organization. They include lack of intelligent BD sources, lack of scalable real-time analytics capabilities, the concerns about data privacy and information security regulations, the problems with data integration, lack of availability of cost effective storage subsystem, and a lack of data scientists (who have the technical savvy for big data) [8].

A big challenge is about data privacy and what is shared versus what is not shared. The extensive collection of personal data raises serious concerns for individuals, firms, and governments [9]. There is great public fear concerning inappropriate use of personal data. There is no clarity on the issues of regulation and compliance. Companies should solve big data problems while assuring privacy and security.

Since information is power, there is potential misuse of big data. The BD age is causing risk and storage cost problems for businesses. Business companies cannot reap the full benefits of a transition to using BD unless they are willing to manage change. Embracing BD will require addressing these challenges.

 

## VI. CONCLUSION

Big data is viewed as a game changer that is capable of revolutionizing the way many businesses operate and compete. Increasingly, it is regarded as the most strategic resource of the 21st century, similar in importance to gold and oil [10]. Without a doubt, BD will continue to play a crucial role in many industries around the world. It can do great wonders for an organization. Businesses across industries should aggressively start building their BD capabilities.

We are in the big data era and data is on everybody's mind. Companies in every sector are required to deal with big data. The impact of data abundance goes well beyond business. Big data is also transforming social networks, healthcare, education, government, just to name a few. For more information on big data in business, the reader should consult books on the subject available at Amazon.com and the journal exclusively devoted to big data: *Journal of Big Data.*

## REFERENCES

[1] R. Schroeder, "Big data business models: challenges and opportunities," *Cogent Social Sciences*, vol. 2, 2016.

[2] M. N.O. Sadiku, M. Tembely, and S.M. Musa,"Big data: an introduction for engineers," *Journal of Scientific and Engineering Research*, vol. 3, no. 2, 2016, pp. 106-108.

[3] I. Yaqoob et al., "Big data: From beginning to future," *International Journal of Information Management*, vol. 36, 2016, pp. 1231–1247.

[4] N. Sharma, D. Sawai, and G. Surve, "Big data analytics: impacting business in big way," *Proceedings of International Conference on Data Management, Analytics and Innovation*, Pune, India, February 2017, pp. 111-116.

[5] A. Amado et al., "Research trends on big data in marketing: A text mining and topic modeling based literature analysis," *European Research on Management and Business Economics*, vol. 24, 2018, pp. 1–7.

[6] C. Johnson, "Reinventing Business Intelligence: 7 Ways Big Data is Changing Business," February 2017.https://www.business.com/articles/reinventing-business-intelligence-7-ways-big-data-is-changing-business/

[7] J. R. Alan et al., "A review on the role of big data in business," *International Journal of Computer Science and Mobile Computing*, vol. 3, no. 4, April 2014, pp. 446-453.

[8] J. Rama, C. Zhang, and A. Koronios, "The implications of Big Data analytics on Business Intelligence: A qualitative study in China," *Procedia Computer Science*, vol. 87, 2016, pp. 221 – 226.

[9] I. Lee, "Bigdata:dimensions,evolution,impacts,and challenges," *Business Horizons*, vol. 60, 2017, pp. 293-303.

[10] A. Alharthi, V. Krotov, and M. Bowman, "Addressing barriers to big data," Business *Horizons*, vol. 60, 2017, pp. 285-292.

## AUTHORS

**Matthew N.O. Sadiku** is a professor in the Department of Electrical and Computer Engineering at Prairie View A&M University, Prairie View, Texas. He is the author of several books and papers. His areas of research interest include computational electromagnetics and computer networks. He is a fellow of IEEE.

**Philip O. Adebo** is an instructor at Texas Southern University. He is currently working towards a PhD in Electrical and Computer Engineering, Prairie View A&M University with emphasis on power systems. His research interests include power systems, renewable energy, microgrids, smart-grid systems, restructuring power system and optimization of power systems.

**Sarhan M. Musa** is a professor in the Department of Engineering Technology at Prairie View A&M University, Texas. He has been the director of Prairie View Networking Academy, Texas, since 2004. He is an LTD Sprint and Boeing Welliver Fellow.

 