

## Business Data Science

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### ABSTRACT

Data science is a combination of various tools, algorithms and machine learning principles aimed at discovering hidden patterns of raw data. As you can see in the image above, a data analyst usually describes what is happening by processing the data history. Data scientists, on the other hand, not only perform exploratory analysis to discover insights, but also use various advanced machine learning algorithms to detect the occurrence of a particular event in the future. A data scientist looks at data from different angles, sometimes from angles that have not been addressed before. Thus, data science is primarily used for decision making and prediction using causal analysis (prediction), prescriptive analysis (prediction plus decision making), and machine learning.

**KEYWORDS:** Data Science, Big Data, Business Data, Business Data Science Research.

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### 1. The introduction of data science

Data science is a combination of various tools, algorithms and machine learning principles aimed at discovering hidden patterns of raw data. As you can see in the image above, a data analyst usually describes what is happening by processing the data history. Data scientists, on the other hand, not only perform exploratory analysis to discover insights, but also use various advanced machine learning algorithms to detect the occurrence of a particular event in the future. A data scientist looks at data from different angles, sometimes from angles that have not been addressed before. Thus, data science is primarily used for decision making and prediction using causal analysis (prediction), prescriptive analysis (prediction plus decision making), and machine learning.

### 2. Data scientists

Data scientists are collectors of big data and collect and analyze large sets of structured and unstructured data. A computer scientist combines data from computer science, statistics and mathematics. They analyze, process, and model data and then interpret the results to create operational plans for other companies and organizations. Data scientists are analytics professionals who use their skills in technology and social sciences to find trends and manage data (Masters-in-Data-Science, 2020). They use industry knowledge, textual understanding, a meticulous look at existing assumptions, to discover solutions to business challenges. The job of a data scientist typically involves creating disordered data from sources such as smart devices, social media feeds, and emails that are not exactly in a database. The role of Data scientist in data analysis is shown in Figure 1.

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• [http://www.jbdsr.com/article\\_680447.html](http://www.jbdsr.com/article_680447.html)

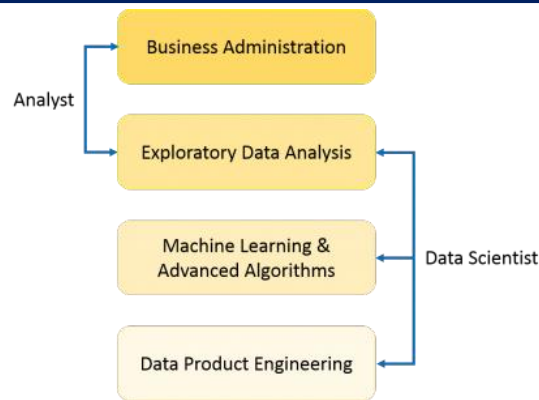


Figure 1. Role of Data scientist in data analysis

### 3. Introducing Business Data Science

Business data science is an emerging and rapidly growing field that uses advanced data science technology to gain useful knowledge and commercial value from large amounts of data. This concept will have a profound effect on today's technology-based business world. Interdisciplinary skills in business, mathematics, computer science, information systems, and engineering are required for business data science.

### 4. Importance and necessity of business data science

Data science can add value to any business that can make good use of its data. From statistics and insights on workflows and hiring new employees, to helping senior executives make better decisions, information is valuable to any company in any industry. The use of data analysis in business is the business that firms can no longer ignore (Deighan, 2016). The macro data is sometimes complicated and difficult to understand, but the jobs that implement systems and strategies to collect, analyze, and use the data experience good benefits in different fields of their performance (Data-Flair, 2021). The Importance of data science in business is shown in Figure 2.



Figure 2. Importance of data science in business (Data-Flair, 2021)

### 5. Dimensions of data science

Data science with dimensions and sciences such as data, data-driven decision making, data mining, statistics, computer science, machine learning, data illustration, big data, business intelligence, modeling, optimization, text mining, pattern recognition, artificial intelligence and soft computing is directly related. Here are three powerful aspects of this science:

#### 5.1. Big Data

Big data, or the data academy, is a very large, fast-paced data asset that requires new processing methods to provide decision-making, new insight, and advanced processing optimization. Big data determines the direction of business movement and workflow process in organizations. In big data, we are dealing with distinct and large data that are constantly changing in terms of volume, data production rate, and variety. Metadata is rapidly expanding from a few 10 terabytes to several petabytes in a data set. Examples of metadata: web reports, radio wave recognition systems, sensor

networks, social networks, Internet texts and documents, Internet search indexes, astronomy, medical records, photo archives, video archives, geological and large-scale business research.

## 5.2. Machine learning

Machine learning is the scientific study of algorithms and statistical models used by computer systems that benefit from patterns and inferences to perform tasks instead of using explicit instructions. As a subset of artificial intelligence, machine learning algorithms create a mathematical model based on sample data or "training data" for predicting or making decisions without obvious planning (Demertzis, 2019). You probably use machine learning several times a day, even without knowing it. Every time you do an Internet search on Google or Bing, machine learning takes place because their machine learning software understands how to rank for a web page. When Facebook or the Apple Photo App recognizes your friends and pictures, it's machine learning. Every time you check your email and your spam filter gets rid of thousands of spammers, this is why your computer has learned to distinguish spam from non-spam. This is machine learning. It's science that allows computers to learn about a particular subject without the need for an explicit program (Bhavsar et al., 2017).

## 5.3. Business Intelligence (BI)

Business intelligence is a set of theories, methods, processes, architectures, and technologies used to turn raw data into useful and meaningful information. Business information uses large amounts of information to identify and develop new opportunities. Taking advantage of new opportunities and implementing an effective strategy can bring a competitive market advantage and long-term sustainability. Common functions of business intelligence technologies include reporting, online analytical processing, analytics, data mining, process mining, and complex event processing. processing, business performance management, benchmarking, text mining, predictive analytics and prescriptive analytics. BI technologies can manage large amounts of structured and sometimes unstructured data to help identify, develop, or create new strategic business opportunities (Rud, 2009). In fact, the goal of commercial intelligence technologies is to enable easy processing and interpretation of big data. Identifying new opportunities and implementing an effective strategy based on a strong business insight can provide businesses with a long-term competitive advantage in the market.

## 4. Journal of Business Data Science Research (JBDSR)

We are living in the "Age of Data", with new data being produced from all industries and public bodies at an unprecedented and constantly growing rate (Mikalef et al., 2019). As a result, there has been a great hype which has led organizations to make substantial investments in their quest to explore how they can use their data to create value. Nowadays, the intensive and widespread use of mechanisms for data capture, storage, and analysis has become an everyday process for businesses. Also, efforts are focused on the honing of methods for the analysis and treatment of large amounts of data, aiming at strengthening the decision-making process in order to generate greater value for the company.

Journal of Business Data Science Research (JBDSR) is a peer-reviewed open access quarterly journal devoted to the field of data science and finance, marketing, accounting systems, operations and supply chain management, information systems, innovation and entrepreneurship, and organizational behavior. The journal scope covers academic and empirical studies on all business knowledge aspects and data science.

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