**Drivers for Big Data**

Big Data has quickly risen to become one of the most desired topics in the industry.

The main business drivers for such rising demand for Big Data Analytics are:

1. The digitization of society

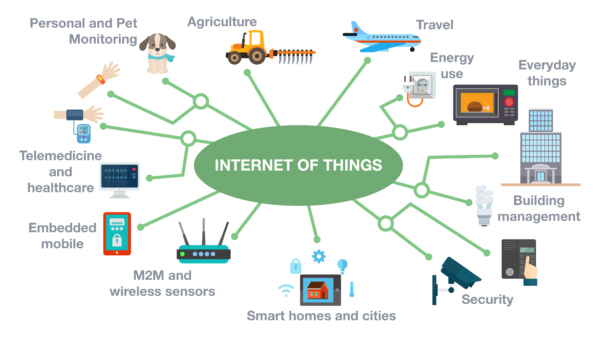
2. The drop in technology costs

3. Connectivity through cloud computing

4. Increased knowledge about data science

5. Social media applications

6. The rise of Internet-of-Things (IoT)



Example: A number of companies that have Big Data at the core of their strategy like :

Apple, Amazon, Facebook and Netflix have become very successful at the beginning of the 21st century.

**What is Big Data Analytics?**

Big Data analytics is a process used to extract meaningful insights, such as hidden patterns, unknown correlations, market trends, and customer preferences. Big Data analytics provides various advantages—it can be used for better decision making, preventing fraudulent activities, among other things.

**Uses and Examples of Big Data Analytics**

​​There are many different ways that Big Data analytics can be used in order to improve businesses and organizations. Here are some examples:

* Using analytics to understand customer behavior in order to optimize the customer experience
* Predicting future trends in order to make better business decisions
* Improving marketing campaigns by understanding what works and what doesn't
* Increasing operational efficiency by understanding where bottlenecks are and how to fix them
* Detecting fraud and other forms of misuse sooner

**Benefits and Advantages of Big Data Analytics**

**1. Risk Management**

Use Case: Banco de Oro, a Phillippine banking company, uses Big Data analytics to identify fraudulent activities and discrepancies. The organization leverages it to narrow down a list of suspects or root causes of problems.

**2. Product Development and Innovations**

Use Case: Rolls-Royce, one of the largest manufacturers of jet engines for airlines and armed forces across the globe, uses Big Data analytics to analyze how efficient the engine designs are and if there is any need for improvements.

**3. Quicker and Better Decision Making Within Organizations**

Use Case: Starbucks uses Big Data analytics to make strategic decisions. For example, the company leverages it to decide if a particular location would be suitable for a new outlet or not. They will analyze several different factors, such as population, demographics, accessibility of the location, and more.

**4. Improve Customer Experience**

Use Case: Delta Air Lines uses Big Data analysis to improve customer experiences. They monitor tweets to find out their customers’ experience regarding their journeys, delays, and so on. The airline identifies negative tweets and does what’s necessary to remedy the situation. By publicly addressing these issues and offering solutions, it helps the airline build good customer relations.

**The Lifecycle Phases of Big Data Analytics**

Now, let’s review how Big Data analytics works:

* Stage 1 - Business case evaluation - The Big Data analytics lifecycle begins with a business case, which defines the reason and goal behind the analysis.
* Stage 2 - Identification of data - Here, a broad variety of data sources are identified.
* Stage 3 - Data filtering - All of the identified data from the previous stage is filtered here to remove corrupt data.
* Stage 4 - Data extraction - Data that is not compatible with the tool is extracted and then transformed into a compatible form.
* Stage 5 - Data aggregation - In this stage, data with the same fields across different datasets are integrated.
* Stage 6 - Data analysis - Data is evaluated using analytical and statistical tools to discover useful information.
* Stage 7 - Visualization of data - With tools like Tableau, Power BI, and QlikView, Big Data analysts can produce graphic visualizations of the analysis.
* Stage 8 - Final analysis result - This is the last step of the Big Data analytics lifecycle, where the final results of the analysis are made available to business stakeholders who will take action.

**Different Types of Big Data Analytics**

Here are the four types of Big Data analytics:

1. Descriptive Analytics

This summarizes past data into a form that people can easily read. This helps in creating reports, like a company’s revenue, profit, sales, and so on. Also, it helps in the tabulation of social media metrics.  
  
2. Diagnostic Analytics

This is done to understand what caused a problem in the first place. Techniques like drill-down, data mining, and data recovery are all examples. Organizations use diagnostic analytics because they provide an in-depth insight into a particular problem.  
  
3. Predictive Analytics

This type of analytics looks into the historical and present data to make predictions of the future. Predictive analytics uses data mining, AI, and machine learning to analyze current data and make predictions about the future. It works on predicting customer trends, market trends, and so on.  
  
4. Prescriptive Analytics

This type of analytics prescribes the solution to a particular problem. Perspective analytics works with both descriptive and predictive analytics. Most of the time, it relies on AI and machine learning.  
  
**Big Data Analytics Tools**

Here are some of the key big data analytics tools :

* [Hadoop](https://www.simplilearn.com/tutorials/hadoop-tutorial/what-is-hadoop) - helps in storing and analyzing data
* MongoDB - used on datasets that change frequently
* Talend - used for data integration and management
* Cassandra - a distributed database used to handle chunks of data
* Spark - used for real-time processing and analyzing large amounts of data
* STORM - an open-source real-time computational system
* Kafka - a distributed streaming platform that is used for fault-tolerant storage

**Big Data Industry Applications**

Here are some of the sectors where Big Data is actively used:

* Ecommerce - Predicting customer trends and optimizing prices are a few of the ways e-commerce uses Big Data analytics
* Marketing - Big Data analytics helps to drive high ROI marketing campaigns, which result in improved sales
* Education - Used to develop new and improve existing courses based on market requirements
* Healthcare - With the help of a patient’s medical history, Big Data analytics is used to predict how likely they are to have health issues
* Media and entertainment - Used to understand the demand of shows, movies, songs, and more to deliver a personalized recommendation list to its users
* Banking - Customer income and spending patterns help to predict the likelihood of choosing various banking offers, like loans and credit cards
* Telecommunications - Used to forecast network capacity and improve customer experience
* Government - Big Data analytics helps governments in law enforcement, among other things

**Assignment**

1. Choose at least three different industries and investigate how big data analytics is applied in each:

a. E-commerce and Retail

b. Healthcare

c. Financial Services

d. Telecommunications

e. Marketing and Advertising

f. Manufacturing and Supply Chain

g. Transportation and Logistics

h. Energy and Utilities

i. Government and Public Services

j. Education

k. Internet of Things (IoT)

l. Social Media and Content Recommendation

m. Sports Analytics

n. Environmental Monitoring

1. Case Study:
   * Select one specific real-world case study where big data analytics has been successfully applied. Describe the problem statement, data sources, analytics techniques used, and the impact of the analysis.
2. Ethical Considerations:
   * Discuss the ethical implications of big data analytics, such as data privacy, security, and bias.
3. Conclusion:
   * Summarize the key takeaways from the assignment and discuss the future prospects of big data analytics.

Submission Guidelines:

* Prepare a well-structured report with appropriate headings and subheadings.
* Include relevant diagrams, charts, or graphs to support your explanations.
* Cite all the sources used in the assignment using the appropriate citation style.