DATA SCIENCE APPLICATION

Over view of data science

❖ **What is data science?**

- Data science is the study of data to extract meaningful insights for business.
- It is a multidisciplinary approach that combines principles and practices from the fields of mathematics, statistics, artificial intelligence, and computer engineering to analyse large amounts of data.
- This analysis helps data scientists to ask and answer questions like what happened, why it happened, what will happen, and what can be done with the results.

❖ **Why is data science important?**

- Data science is important because it combines tools, methods, and technology to generate meaning from data.
- Modern organizations are inundated with data; there is a proliferation of devices that can automatically collect and store information.
- Online systems and payment portals capture more data in the fields of e-commerce, medicine, finance, and every other aspect of human life.
- We have text, audio, video, and image data available in vast quantities.

❖ **History of data science**

- While the term data science is not new, the meanings and connotations have changed over time. The word first appeared in the ’60s as an alternative name for statistics. In the late ’90s, computer science professionals formalized the term. A proposed definition for data science saw it as a separate field with three aspects: data design, collection, and analysis.
- It still took another decade for the term to be used outside of academia.

❖ **Future of data science**

- **Artificial intelligence** and **machine learning** innovations have made data processing faster and more efficient.
- Industry demand has created an ecosystem of courses, degrees, and job positions within the field of data science.
- Because of the cross-functional skillset and expertise required, data science shows strong projected growth over the coming decades.

Who is Data Scientist?

Is he/she someone struggling with data all day and night or experimenting in his/her laboratory with complex mathematics? After all, ‘Who is a Data Scientist’?

There are many definitions available in the market for Data Scientists.

In simple words, a Data Scientist is one who knows and practices the art of Data Science. Data Scientists are those scientists who crack complex data problems with their strong expertise in certain scientific disciplines. They work with many elements related to mathematics, statistics, probability, Quantitative and Qualitative forecasting, computer science, etc. (though they may not be an expert in all these fields).

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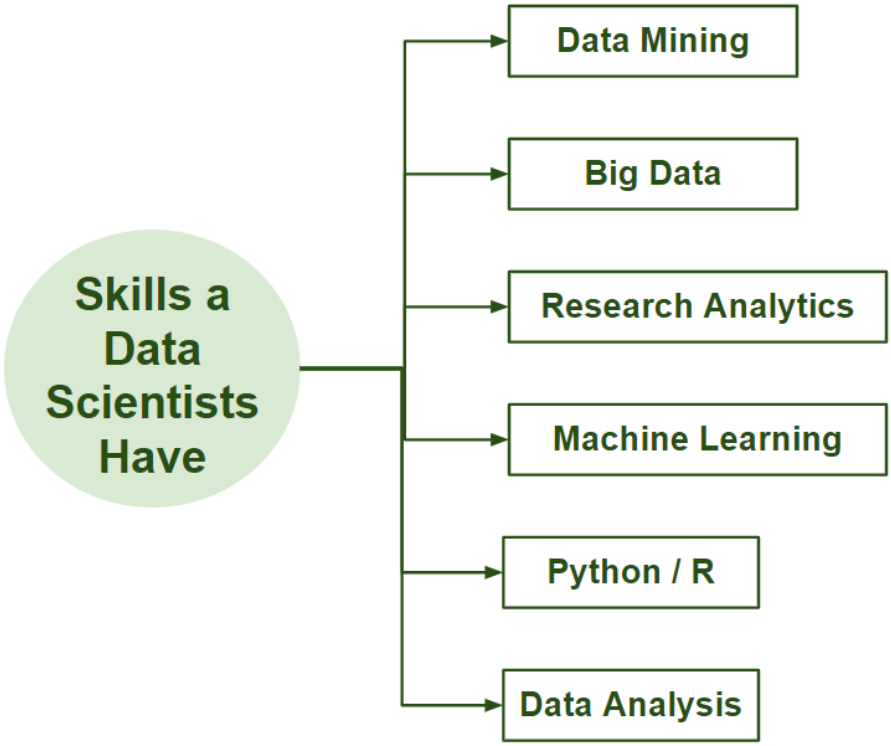

We can say that Data Scientists are Business Analysts and Data Analysts, with a difference!

❖ **Applications of Data Science:**

Following is some of the applications that make use of Data Science for their services:

- Internet Search Results (Google)
- Recommendation Engine (Spotify)
- Intelligent Digital Assistants (Google Assistant)
- Autonomous Driving Vehicle (Waymo)
- Spam Filter (Gmail)
- Abusive Content and Hate Speech Filter (Facebook)
- Robotics (Boston Dynamics)
- Automatic Piracy Detection (YouTube)

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Real-world Applications of Data Science

1. In Search Engines

The most useful application of Data Science is Search Engines. As we know when we want to search for something on the internet, we mostly use Search engines like Google, Yahoo, Safari, Firefox, etc. So, Data Science is used to get Searches faster.

2. In Transport

Data Science is also entered in real-time such as the Transport field like Driverless Cars. With the help of Driverless Cars, it is easy to reduce the number of Accidents. The help of Data Science techniques, the Data is analysed like what as the speed limit in highways, Busy Streets, Narrow Roads, etc. And how to handle different situations while driving etc.

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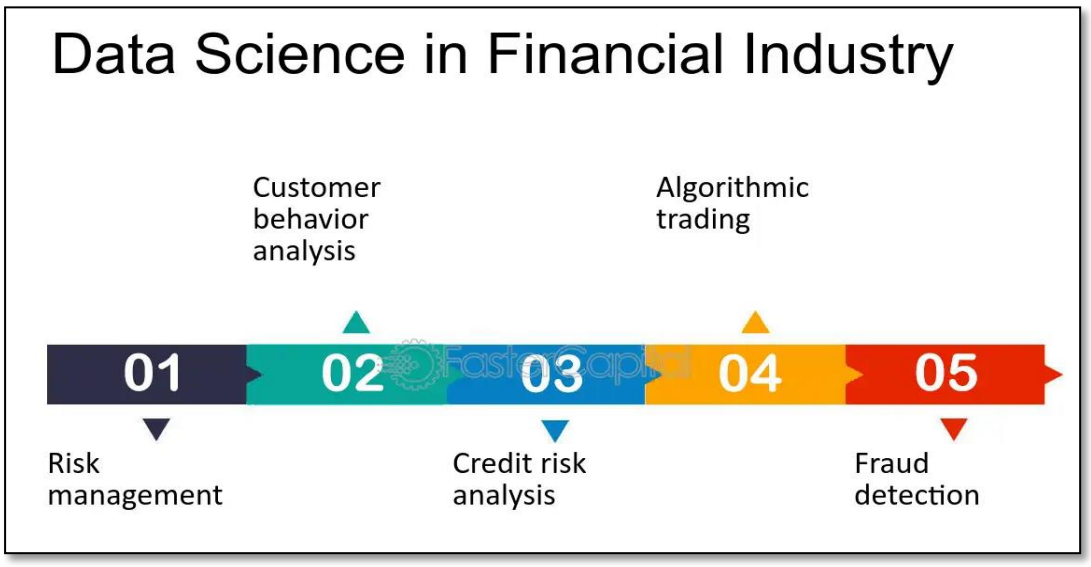
3. In Finance

Data Science plays a key role in Financial Industries. Financial Industries always have an issue of fraud and risk of losses. Thus, Financial Industries needs to automate risk of loss analysis in order to carry out strategic decisions for the company.

Also, Financial Industries uses Data Science Analytics tools in order to predict the future. It allows the companies to predict customer lifetime value and their stock market moves.

For Example, In Stock Market, Data Science is the main part. In the Stock Market



4. In E-Commerce

E-Commerce Websites like Amazon, Flipkart, etc. uses data Science to make a better user experience with personalized recommendations.

For Example, when we search for something on the E-commerce websites we get suggestions similar to choices according to our past data and also we get recommendations according to most buy the product, most rated, most searched, etc. This is all done with the help of Data Science.

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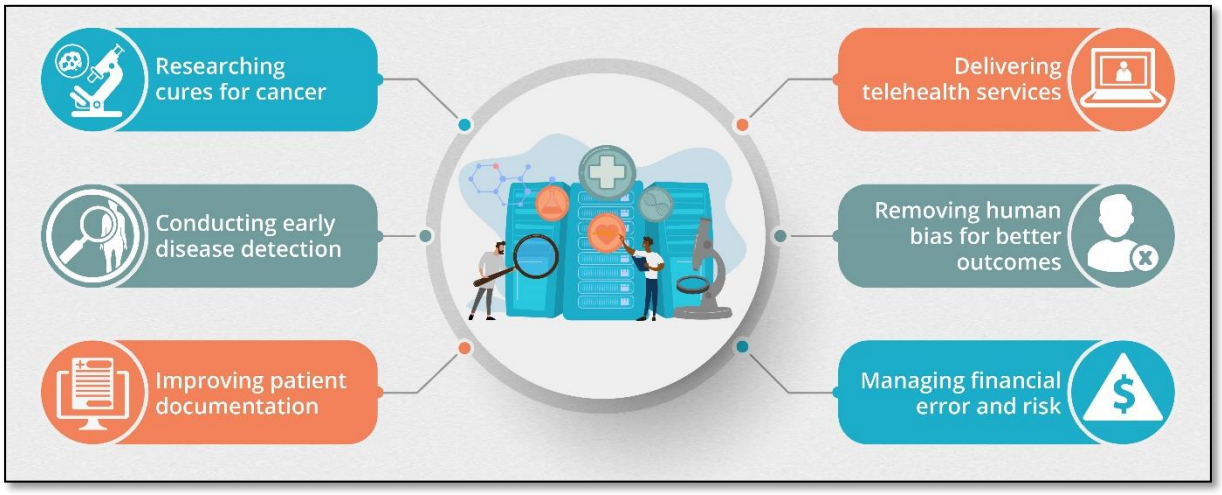
5. In Health Care

In the Healthcare Industry data science act as a boon. Data Science is used for:

- Detecting Tumour.
- Drug discoveries.
- Medical Image Analysis.
- Virtual Medical Bots.
- Genetics and Genomics.
- Predictive Modelling for Diagnosis etc.



6. Image Recognition

Currently, Data Science is also used in Image Recognition.

For Example, when we upload our image with our friend on Facebook, Facebook gives suggestions Tagging who is in the picture. When an Image is Recognized, the data analysis is done on one's Facebook friends and after analysis, if the faces which are present in the picture matched with someone else profile, then Facebook suggests us auto-tagging.

7. Targeting Recommendation

Targeting Recommendation is the most important application of Data Science. Whatever the user searches on the Internet, he/she will see numerous posts everywhere. This can be explained properly with an example: Suppose I want a mobile phone, so I just Google search

it and after that, I changed my mind to buy offline. In Real -World Data Science helps those companies who are paying for Advertisements for their mobile. So everywhere on the internet in the social media, in the websites, in the apps everywhere I will see the recommendation of that mobile phone which I searched for.

8. Airline Routing Planning

With the help of Data Science, Airline Sector is also growing like with the help of it, it becomes easy to predict flight delays. It also helps to decide whether to directly land into the destination or take a halt in between like a flight can have a direct route from Delhi to the U.S.A or it can halt in between after that reach at the destination.

9. Data Science in Gaming

In most of the games where a user will play with an opponent i.e. a Computer Opponent, data science concepts are used with machine learning where with the help of past data the computer will improve its performance. There are many games like Chess, EA Sports, etc. will use Data Science concepts.

10. Medicine and Drug Development

The process of creating medicine is very difficult and time-consuming and has to be done with full disciplined because it is a matter of Someone's life. Without Data Science, it takes lots of time, resources, and finance or developing new Medicine or drug but with the help of Data Science, it becomes easy because the prediction of success rate can be easily.
The algorithms based on data science will forecast how this will react to the human body without lab experiments.

11. In Delivery Logistics

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Various Logistics companies like DHL, FedEx, etc. make use of Data Science. Data Science helps these companies to find the best route for the Shipment of their Products, the best time suited for delivery, the best mode of transport to reach the destination, etc.

12. Autocomplete

AutoComplete feature is an important part of Data Science where the user will get the facility to just type a few letters or words, and he will get the feature of auto-completing the line. In Google Mail, when we are writing formal mail to someone so at that time data science concept of Autocomplete feature is used where he/she is an efficient choice to auto-complete the whole line. Also, in Search Engines in social media, in various apps, AutoComplete feature is widely used.

- **Importance of data-driven decision-making**

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❖ **WHAT IS DATA-DRIVEN DECISIOAN-MAKING?**

- Data-driven decision-making (sometimes abbreviated as DDDM) is the process of using data to inform your decision-making process and validate a course of action before committing to it.
- In business, this is seen in many forms. For example, a company might:
- Collect survey responses to identify products, services, and features their customers would like
- Launch a new product or service in a test market in order to test the waters and understand how a product might perform in the market

❖ **HOW TO BECOME MORE DATA-DRIVEN**

If you have a goal of becoming more data-driven in your approach to business, there are many steps you can take to reach that goal.

- ✓ Look for Patterns Everywhere
- ✓ Tie Every Decision Back to the Data
- ✓ Visualize the Meaning Behind the Data
- ✓ Consider Furthering Your Education

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❖ EXAMPLES OF DATA-DRIVEN DECISION-MAKING

- To better understand how your organization can incorporate data analytics into its decision-making process, consider the success stories of these well-known businesses.

1. Leadership Development at Google

- Google maintains a heavy focus on what it refers to as "people analytics."
- As part of one of its well-known people analytics initiatives, Project Oxygen, Google mined data from more than 10,000 performance reviews and compared the data with employee retention rates.
- Google used the information to identify common behaviours of high-performing managers and created training programs to develop these competencies.

2. Real Estate Decisions at Starbucks

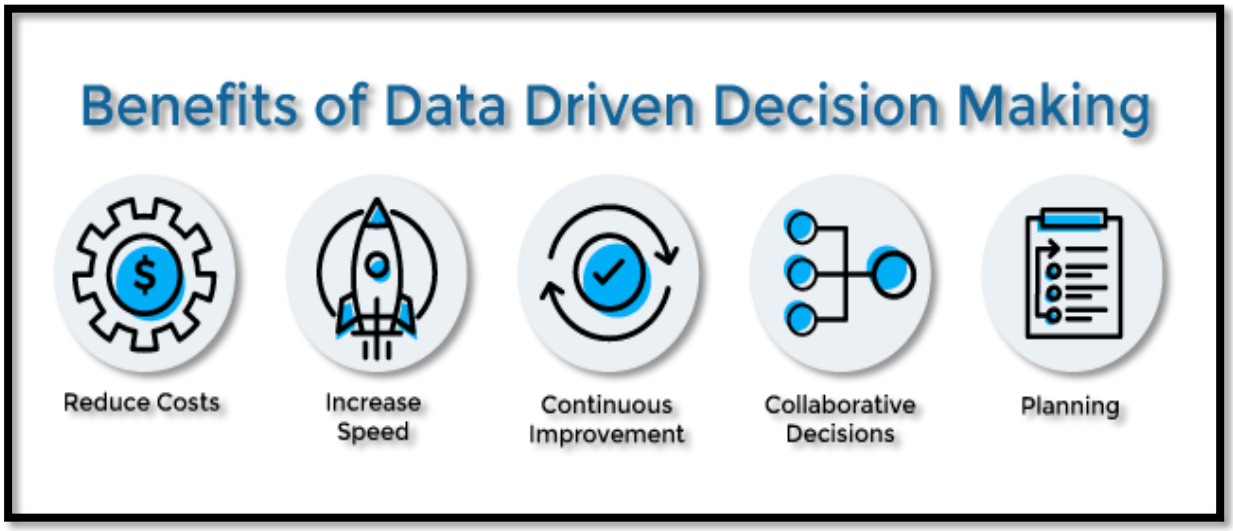
- After hundreds of Starbucks locations were closed in 2008, then-CEO Howard Schultz promised that the company would take a more analytical approach to identifying future store locations.
- Starbucks now partners with a location-analytics company to pinpoint ideal store locations using data like demographics and traffic patterns.
- Starbucks uses this data to determine the likelihood of success for a particular location before taking on a new investment.

3. Driving Sales at Amazon

- Amazon uses data to decide which products they should recommend to customers based on their prior purchases and patterns in search behaviour.
- Rather than blindly suggesting a product, Amazon uses data analytics and machine learning to drive its recommendation engine

❖ BENEFITS OF DATA-DRIVEN DECISION-MAKING

While there are many benefits to data-driven decision-making, it's important to note that you don't need to take an all-or-nothing approach to get there. By starting small, benchmarking your performance, documenting everything, and adjusting as you go, you can become more data-driven and thrive at your organization.



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1. You'll Make More Confident Decisions

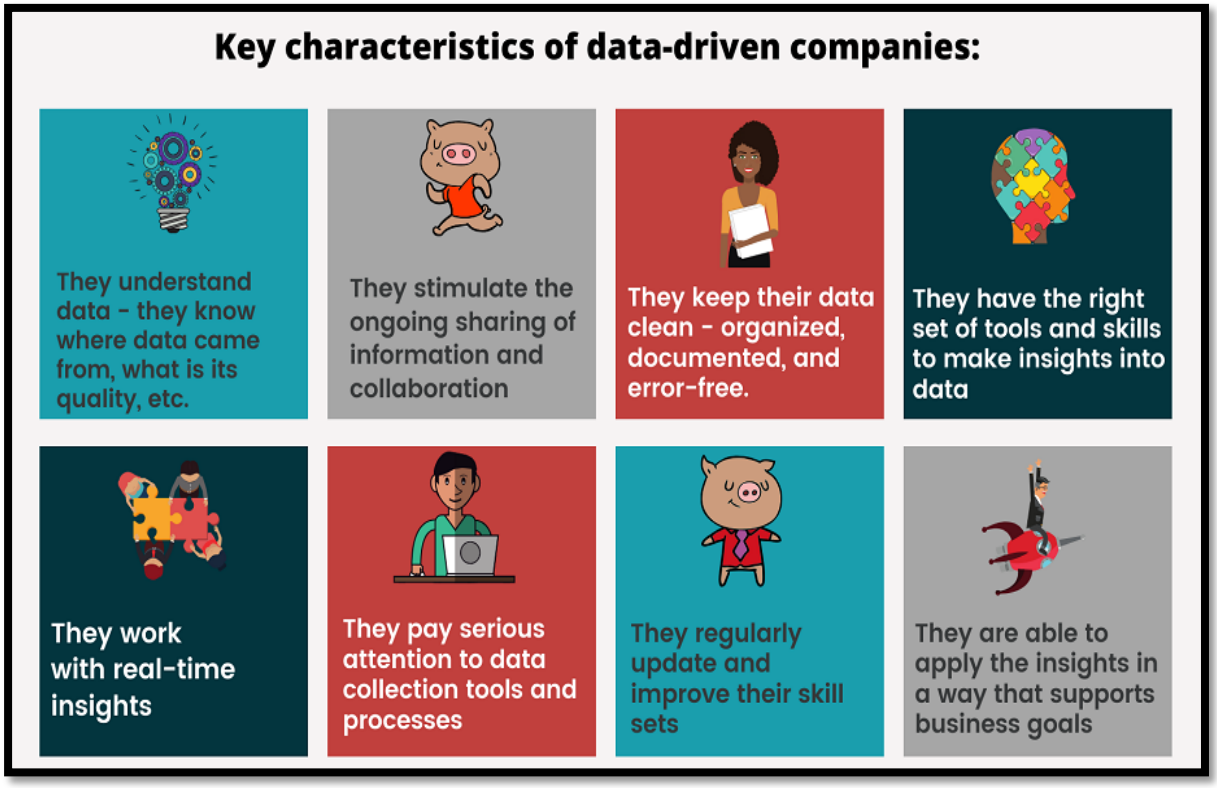
- Once you begin collecting and analysing data, you're likely to find that it's easier to reach a confident decision about virtually any business challenge, whether you're deciding to launch or discontinue a product, adjust your marketing message, branch into a new market, or something else entirely.
- Data performs multiple roles. On the one hand, it serves to benchmark what currently exists, which allows you to better understand the impact that any decision you make will have on your business.
- Just because a decision is based on data doesn't mean it will always be correct. This is why the impact of every business decision should be regularly measured and monitored.

2. You'll Become More Proactive

- When you first implement a data-driven decision-making process, it's likely to be reactionary in nature. The data tells a story, which you and your organization must then react to.
- While this is valuable in its own right, it's not the only role that data and analysis can play within your business.
- for example, by identifying business opportunities before your competition does, or by detecting threats before they grow too serious.

3. You Can Realize Cost Savings

- There are many reasons a business might choose to invest in a big data initiative and aim to become more data-driven in its processes.
- "Big data is already being used to improve operational efficiency,"



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