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# Data Science Helping in Decision Making

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***Abstract:*** ***Technology is changing at a very fast rate. It is affecting our day to day life. It is being upgraded to make our life easier and make the things work faster. Earlier computers used to be a very simple machine with some basic tasks such as calculating, saving data and for playing games. But now many algorithms and technologies came into existence that made computers a faster, intelligent and super machines which is capable of doing tasks which humans can't do. One such technology is Data science, earlier computers were used only to save data but analysis of that data could only be done by the humans. Data science now helped humans to get the analysis of the saved data from the computers itself. Many such algorithms and applications can be installed in the computers to analyse the data and bring out the meaningful trends from it.***
***Keywords: Data Science, statistics, Big data, graphs, decision making***

## I. INTRODUCTION

Big data now is the buzz in the world of technology. Big data has the ability to change the business model and day to day decision making that accompany emerging data analysis. The growing combination of applications, data, algorithms have huge implications on Supply Chain Management widening the opportunities for the business and various other purposes. With the increasing technology data is increasing so the storing capacity, analysing capacity is required. Thus data science came into existence which helps humans to analyse the data and perform various functions on it. New solutions to new problems have been proposed rapidly for large amount of data.

Current and future challenges require greater care in creating new solutions that satisfy the rationality of each type of problem. Data are widely considered to be a driver of better decision making and improved profitability for an organisation, and this perception has some data to back it up.

However for the data science to serve business effectively a thorough command over the data of the organisation should be there and a deep analysis is to be made to bring out the better predictions for the betterment of the organisation. Data is also used to establish relationship among various closed relations concepts to tell what are the basic principles under category of data science. Once the control over data is made we can easily understand and explain what data science has to offer. Once we are able to extract trends from the data and are able to extract required information from it then only, we can call that process as data science

## II. WHAT IS DATA SCIENCE?

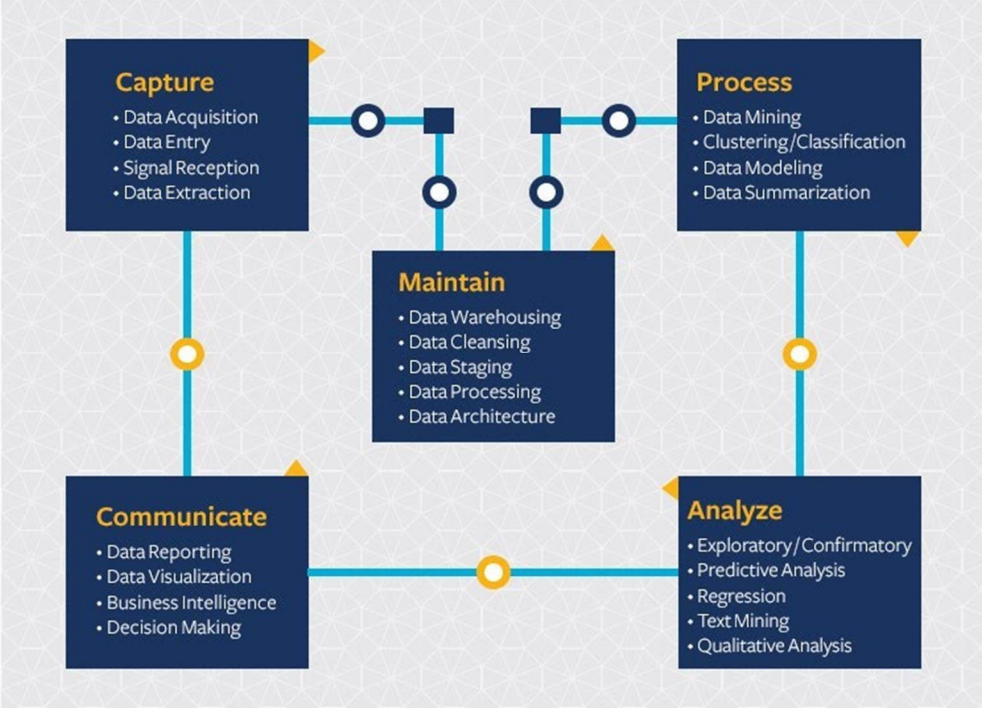
Data science is defined as a collection of characteristic rules that is used to extract knowledge and information from a data. Data mining can be called a very closed concept of Data science. The use of the term Data science is becoming common with Big Data. Data science is made by combining two terms DATA and SCIENCE, where *science* implies knowledge gained by systematic study. It is a part of the organisation that builds and organises in the form of explanations and predictions about the particular organisation. Data science focuses around Data by the use of statistics, which gives a systematic study about the organisation, properties and analysis of data and their role in inference.

The *Data* available with the organisation is in the heterogenous and unstructured form texts, images, videos which are to be sorted in a particular manner as well as other complex relationship among entities. There are hundreds of data mining algorithms that can be applied according to the field of use.Underlying these algorithms are the set of fundamental principles that are required for the extraction of knowledge and trends in a required format. These algorithms and principles can be applied broadly in the functional areas within an organisation.

Data science is the integration of statistics, data analysis, informatics and their relations with other methods. Data science uses the way of extraction and properties extracted from different fields within the broad category of mathematics, statistics, computer science, information science and domain knowledge. A Data Scientist is someone who creates methods within a code and combines it with statistics to create insights from data and bring out the required trends. Data science is increasingly about the predictions on observations that will occur in the future.

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(Image Source: datascience@berkeley)

## III. NEED OF DATA SCIENCE IN AN ORGANISATION

Time has changed, from working with small sets of structured data to large mines of unstructured and semi structured data coming from various sources. The traditional business intelligence tools fall short when it comes to process such massive pool of unstructured data. Data science comes with many advanced tools to work on large amounts of data coming from various sources such as marketing, financial logs, multimedia files, text files, sensors and instruments. Not only in business organisations but also in various organisations Data Science is now becoming a important part to be used, such organisations are:

*1)* Data science is used for *predictive analysis* which can be used in weather forecasting. This can be done on the data which is gathered through satellites and radars used to detect the disturbances.
*2)* It can be used for *product recommendations* by bringing out the trends from the old data and the new data collected by survey team. It can give very precise information.
*3)* Data science can help in *effective decision making*, on the spur of the moment. Best example for it can be the self driving cars, which collect data in real time from its surroundings through sensors, radars, cameras, lasers and all this makes car move in the direction
*4)* *Machine learning* algorithms also take help from data science. A machine collects lots of data from various sources and analyses it accordingly gives the desired answer.

## IV. DATA SCIENCE HELPING IN DECISION MAKING

Data science is the combination of principles, methods, techniques, for understanding data and the phenomena to be applied over data. The ultimate goal of data science is to improve decision making as this is the most important perspective for a business. Data driven decision (DDD) making refers to the task of extracting out correct knowledge from the study of data rather than overviewing the data and predicting intuitions.

Economist Erik Brynjolfsson from MIT recently conducted a study on how DDD affects organisation's performance. They developed a measure that how strongly they use data to make decisions across the company. They show graphically that the more data dependent a firm is, the more productive it is- even controlling for a wide range of possible confounding factors. And the real differences came out to be very big; one standard deviation higher on the DDD scale is associated with a 4-6% increase in productivity. DDD is also co-related with a higher return on assets, return on equity, asset utilization and market value and relationship seems to be casual.

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## V. DATA PROCESSING THROUGH BIG DATA

Despite the impression from the internet, there is a huge difference between data processing and applying data science over the data. Data engineering and processing are not always related to data science, they may or may not support the process of data science. Technologies involved in data processing for business do not involve only analysing or decision making but also has modern web system processing, efficient transaction processing, online advertising campaign management and so on.

In simple language Big Data can be considered as datasets that are very large in size and hard to be handled by traditional data processing systems and so it requires new technologies for handling. Big Data technologies may include Hadoop, Hbase, CouchDB. Big data technologies are used for various categories of work such as analysing data..

Many economists examined that to which extent utilization of Big data technologies can help the firms. They noticed that after controlling various factors and increasing the use of big data technologies firms gained 1-3% higher productivity than the average firm. This leads to potentially very large productivity differences between various firms.

## VI. FUNDAMENTAL CONCEPTS OF DATA SCIENCE

Some of the basic concepts of Data Science are:

*1)* Extracting useful knowledge and trends from the data to solve business problems is the core help from data science
*2)* Evaluation of the results of data science should be done carefully considering where they will be used.
*3)* The relationship between the business problems and the analytic solutions can be further divided into tracable subproblems with the help of framework of analysing expected value.
*4)* The information technology is used to find out the information from the very large collections of data
*5)* Entities that are similar with respect to known features or attributes often are similar with respect to unknown features or attributes.
*6)* To draw conclusion from the results of data science one must carefully see what were the factors involved in it.

## VII. SCOPE OF MY STUDY

Data science encompasses many breakthrough tech concepts like Artificial Intelligence, Internet of things, deep learning and many more. With the increase in such technologies data science impact will increase drastically. With the advancement in technology dependence on data and analysis of data will increase hence the data science will keep on growing and its impact over the business will increase, it will play a crucial role as people will understand the importance of gathering and analysing the data.

As the Data science is a constantly evolving technique, there are lot of career options to be pursued within this and apart from that it will become an important part of the organisations very soon as it has shown good results in predictions and increasing business profits.

Many results and studies have shown that there was a big difference between the result generated based on intuitions and the result brought through a deep analysis with the help of data science.

According to my research, data science should be made necessary to bring the maximum profit from your business and also it will help to analyse data for future market expansion. Storing data and analysing it will become more easier as day to day people are coming near to technology and data science algorithms will also become easier to use in he coming future.

## VIII. CONCLUSION

The extensive collection of techniques for mining data that underlie data science are very much small and limited. In order for data science to flourish as a demanding and useful technology we must think of more detailed algorithms, more principles to work upon, more techniques and more tools and make them common for the organisations to use. We must think about the basic concepts and principles that support for more success of Data driven decision making. The concept of data science are very general in nature and are broadly available.

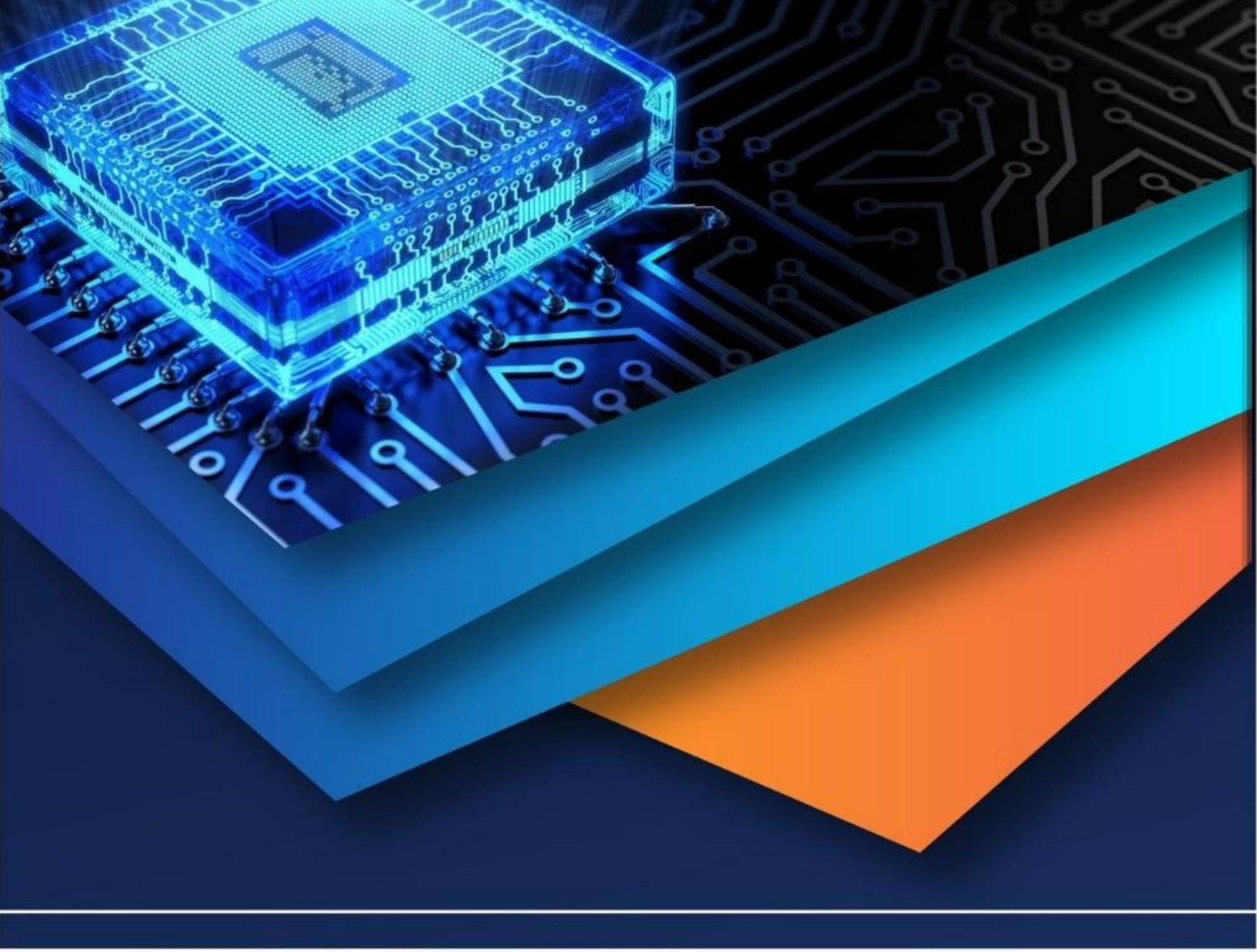
In today's era success of business requires a deep study of the market and the data collected from the market through various surveys, basically today's era is the data oriented where the data plays a major role in taking your business to newer heights through its deep study. Problem analysis and suitable solution for the problem can be extracted with the help of conceptual frameworks that are part of data science. There is a very strong evidence that suggests data science has helped in increasing business outputs via data driven decision making.

Data science helps in data based decision making and sometimes taking decision making at a much higher level such as Big Data.

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