

Data Analytics

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Abstract

Data analytics is a branch of computer science that is used to make a decision in different organizations that are using big data. The data are important for an organization and to the individuals owning them; hence, there are ethical principles that are guiding their use in an organization. It has also been pinpointed that data analytics is being applied in several organizations, such as in the healthcare organizations, when predicting the outbreak of diseases and even the finances that are used in the organization. In research sectors, data analytics have been used to make the processes used to conduct the research simpler and easier to conduct. The experts in data analytics also have advantages when it comes to job seeking since there is a limited number of professionals, and also almost every big organization around the world requires a data analyst, thus, making the career demanded as compared to other information technology professionals.

Keywords: Data analytics, organization, research, ethical principles.

Data analytics involve the raw data that are applied to obtain a conclusion concerning information under research. Most of the techniques processes that have been applied in data analytics are automated into algorithms as well as mechanical processes that are able to effectively function using the raw data to make it easier for consumption by a human. On the contrary, analysis involves the process of inspecting data, cleansing them, transforming as well as modeling the data with the aim of obtaining useful and important information from the data, informing about the conclusion and also supporting the decision made.

Role of data analytics experts

A data analytic professional plays the role of data interpretation and turning the data into information that can be put into use to improve a business positively, hence, affecting the decision made in the business. The analysts also utilize the information from different sources as well as interpret the trend and pattern of the data obtained. In general, analysts need to deal with the duties of analytical nature (Russom, 2011). After the information gathering and interpretation, it is the role of the analysts to report their findings from a comprehensive study to the relevant individuals or colleagues in the organization or business that needed the data analysis and interpretation. Because of reporting back to the management and colleagues, it is usually recommended that the analysts work hand in hand with the team of management as well as other employees in order to establish and accomplish the business needs.

Reasons why studying data analytics is important

There are several reasons why data analytics is an important branch of computer science that should be studied:

1. Data analytics is given priority by most top companies: as the competition in the market increases, most of the top organizations are majoring their attention in data analytics in order to make a good decision when choosing the best market for their products and products. As of now, around 77% of the major organizations are putting data analytics into consideration as a critical part of the performance of their businesses. Furthermore, since the data analytics experts develop a range of skills that are related to their profession, for instance, due to their position in the organization in relation to decision making, these experts have to develop good communication skills. They also develop good leadership skills since they participate in most of the duties done in the firm, more so business decisions, and the future of the business.

2. The course is considered as a source of job opportunity: a number of companies have come to realize that they don't have the capability to do a comprehensive data gathering, data interpretation, and even to effectively use the data they have collected. Therefore, such companies have seen the need to employ specialists that are able to carry out these duties. This is the part where the data analysts chips in, hence creating job opportunities for such individuals. And also, people with the skills of data analysis are few hence making the data analytics professionals to be in high demand.

3. Increased pay for the data analytics professionals: since there is increased demand for the data analysts while the supply of the specialists remains constant or low, the available data analysts have to be paid on the work more than they get paid to meet the demand. In India, as of now, the data analysts are paid around 50% higher than their counterparts in the other computing professions. The trend has been noted to occur almost across the globe. Also, most of the firms are just realizing the importance of the data analytics profession to their businesses.

4. Analytics of big data is everywhere: there is an enormous growth in computer use in most workplaces, also there is a high need for data analytics profession so as to foster the growth, and it is slowly catching on. Generally, there is no sector left out when it comes to data

analytics. Every organization and institution in one way or the other is involved with big data in their activities, hence, making data analytics present almost everywhere.

5. Data analytics professionals are at the core of any decision being made in an organization: in most workplaces, the dissatisfaction comes when an employee is not involved in the decision making in the firm. However, with data analytics professions, the analysts are the ones being consulted whenever there is a decision to be made by a company. This makes these professionals have some cog at the great corporate wheel. To make it weightier, the data analytics professionals make an important part when a company is making a decision related to business and also when laying down the future strategies of the company. Therefore, the analysts play an integral part in an organization where they work.

6. There is a high rate of adopting big data analytics: late companies have started to use social media for advertising their brands and also to engage their customers. On the same note, the companies are also turning to the use of data analytics. Almost all companies have to use social media in their brand. The same is applied to data analytics adoption. Every company wants to assure the customers that their data are safe with them whenever they conduct any transaction with them. This makes the data analytics profession a good career that has a bright future in the job market that should be studied. The job market is also determined by the number of organizations that are being run on a daily basis.

7. Numerous surveys conducted indicate that the rate at which the data analytics is being embraced in different companies is higher than it was expected. According to the survey, data analytics is at the top when compared to other technologies that are used in most industries. This puts data analytics in the limelight so that in the next three years or so, it will be among the top careers needed in every organization. Therefore, this makes the data analytics a profession that doesn't have any unemployed individuals.

8. There is a perfect opportunity of freelancing brought about by data analytics: in the coming future, most of the workforces of data analytics professionals will not be embedded in one job. They would want to diversify on their income sources and also methods by which they can get a perfect balance in their work-life. Since data analytics deal with numbers, trending issues, and data as a whole, it makes the professionals in that field consultants of different firms, hence, well-paid; in comparison to jobs where one sticks to one workplace. The job will be easy to handle since it can be carried out in any part of the world at any particular time; therefore, one doesn't have to be restricted to a given desk in a particular organization.

The data analytics can be applied in different areas as discussed below;

a) Policing/Security

Data analytics has been used in advanced mining of data and texts with the help of the mining tools. This has helped the government and other organizations to capture the apprehended and even anticipated criminal acts with a lot of ease (Russom, 2011). The analytics tools have extensively been applied when investigating crimes and also to monitor any form of communications that can be made by individuals that are suspected to be terrorists. Through the application of data analytics, accurate predictions can easily be made in relation to criminal activities together with the areas these criminals are likely to major their targets with the help of historical data as well as geographical analysis.

b) Banking and finance

Advanced data analytics is of great benefit to the banking sector when it comes to solving several problems in business. This is achieved by the correlation detection of business information and also market prices by the use of data analytics. In addition, data analytics

techniques are used in collecting customer's data whenever they are applying for loans. These techniques help to get the data that related to the customers' recent expenditures that are also useful when determining the customers that have high chances to default their loans once they are provided with the loans.

c) Delivery logistics

In the logistics companies, the operations that are dealing with the delivery efficiency have been enhanced through the use of analytics that is applied to parse the data of local weather and data of real-time GPS. In this case, the analytics are used to figure out the most suitable delivery routes, the most appropriate delivery time, and also the means of transport that is less costly and more secure to avoid the losses packages and prevent accidents. Some of the companies that have applied the data analytics with successfully include the UPS, FedEx, DHL, and any more. These companies have accomplished efficiency in cost, reliability, and customer satisfaction.

d) Planning and development of smart cities

There are various ways that data analytics can be applied in energy management, planning, web provision, and spending in smart cities. The modeling in data analytics would be of great help when making a decision on the most appropriate location in the smart cities to erect structure with the aim of avoiding the problems that can be encountered in the near future such as; overcrowding the place with buildings and ensuring that there is easy accessibility. On the same note, data analytics also helps in the management of energies in these smart cities to enhance the implementation of energy optimization, distribution of energy, and smart-grid management, among other management activities.

e) Customer relationship management

Data analytics working with direct customers is vital when the business or an organization wants to analyze and to know the preferences of some customers and also their behaviors. When it is applied in retail and even e-commerce, data analytics can portray the trends, the pricing models of the organization, detect potential buyers from the firm, and generation of real-time and personalized offers. With these, the business will be in a position to provide the goods as per the taste of the customers, and also, the business is able to know the period when to raise the prices of their product and the time when to lower them.

f) Healthcare

Data analytics is growing rapidly in the healthcare sector. The main focuses in this sector include financial analysis, HR analysis, clinical analysis, fraud, and supply chain analysis. Through the application of data analytics in healthcare, it can be applied in predicting the possibility of an occurrence of a disease outbreak in a given area, depending on the data obtained and analyzed about that area (Raghupathi & Raghupathi, 2014). It also tells true sources of these diseases and the areas that have a high likelihood of the disease spread. This, therefore, helps to save the lives of thousands of people in such areas.

g) Internet/Web search

Heavy data analytics are utilized in companies like Google, AOL, Yahoo, Bing, and Duckduckgo, among others, to crawl as well as index reliable and credible pages of the internet. Due to the enormous size of the internet and its growth, the above-mentioned organizations experience the need to conduct faster scanning and indexing. As a result, it has resolved to deal with the development and research using big data analytics; hence, making data analytics to play a vital role in internet and web search (Russom, 2011).

h) Education

Education data mining, together with data analytics, are objectively used to predict learning behavior, the advancement of the scientific knowledge being obtained from learning, and analyzing the effects of educational support. With the analysis, the system can develop an intelligent curriculum that accommodates the students' needs, learning pace, life experiences, and carry their previous knowledge into the next level in their learning centers. In addition, data analytics can be used in learning institutions to help in crafting experiences in relation to the students' ability, preference, learning style, and the teachers they have.

i) Research and development

Before the introduction of data analytics, researchers spent a lot of time carrying out tests, tweaking, iterating, and repeating these processes as they try to come up with a solution to some particular problems in business. However, with the introduction of data analytics, these research processes have been hastened since the data analytics are providing compensation for the varying data using a generation automatic model and training. The accuracy and research speed have been accelerated with the help of data analytics.

j) Bioinformatics

The analysis and mining of biological data can be used to reveal important knowledge that is related to the inference of protein function, finding of genes, interaction network reconstruction between gene and proteins, and many more. On the contrary, predictive analysis has been discovered to be very useful more so when dealing with disease diagnosis, treatment optimization, prognosis, and also in prediction of the location of protein sub-cells, among other functions.

Ethical principles in Data analytics

The big data analytics have raised several ethical issues more, so when an organization starts to sell its data externally with an intention that is totally different from that in which the data was collected at first (Pardo & Siemens, 2014). The ease and scale in which data analytics is able to be performed have changed the framework of ethics completely. Currently, many things that were impossible in the past can be done with a lot of ease, and also the existing ethical, as well as legal frameworks, do not apply in what is done currently. However, there are still some of the few principles that are agreed to be followed by experts. These principles are as follows;

1. The privacy of the customers' data and their identity should be maintained: there should not be confusion between secrecy and privacy (Pardo & Siemens, 2014). The private data can be exposed for auditing in relation to a legal requirement, however, on the contrary, the same private data when obtained from an individual with their consent are not supposed to be exposed for consumption other people or businesses with any form of trace to the identity of the owner of the data collected.
2. Any information shared privately needs to be treated confidentially: whenever a third party is involved in the sharing of sensitive data such as financial information, medial, or location, the information should be restricted such that it is not shared further to anybody.
3. There should be a transparent view to the client on the way the data is used or even how the data is sold. And also, there should be transparency to the customers in terms of how the flow of their private data is managed across third-party system analytics.
4. No interference should be made on the big data analytics by human will: The use of data analytics can result in moderation and to some extent, lead to the determination of our real being even before coming to a conclusion about an issue under research. Therefore,

every organization should have in mind the prediction as well as interferences that need to accept in the firm, and the one needs not be accepted when dealing with the data analytics.

5. Data analytics are not supposed to cause unfairly biased such as sexism, tribalism, or racism. When using algorithms of machine learning are able to absorb any unconscious biases in a group of people and also amplify these biases through training samples.

With the advancement in data analytics, there are high chances that more principles will be developed to accommodate the more powerful technologies that are being put in place. When making these ethical discussions and making the principles, the data engineers, data scientists, database administrators, and any other individuals dealing with the big data should be involved.

In conclusion, the data analytics field is an important field that is applied in different sectors such as health, education, policy-making, and even in security forces among any other field that is dealing with big data. The field data is also vital when it comes to decision making in the organization and even when predicting the future market of the organization's products. An individual who has studied data analytics is also advantaged since they are directly involved when making an organizational. Also, they play an integral role in the wellbeing of an organization where they work.

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