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Big Data Analytics and Machine Learning – Real World Application and A Game Changer for Fraud, Waste and Abuse

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ABSTRACT

Big Data Analytics is associated with designing strategy to efficiently analyze huge volumes of diverse data, that is gathered from a wide variety of platforms which includes - social media networks, sensors, science, social science domain, cell phones, transaction records, videos, and host of others. The aim of Big Data Analytics is to uncover hidden patterns, extract relevant data from the huge stock of stored data, which might give insight into useful data that may be helpful to make smarter business decisions, an assured way to a successful business. Machine Learning is all about using algorithms for real-time processing of data, the aim being accurate future predictions, which can help simplify tasks and produce error- free results, leading to growth and success in business. The amazing part about the using Machine Learning is that it has cut down human intervention and most importantly provided accurate results. Big Data Analytics and Machine Learning are undeniably the two most powerful real-world applications that has been efficiently used by technology giants to use their Big Data more efficiently, to identify new opportunities, take faster, better and agile business decisions to stay competitive, most importantly keep a check on fraud, waste and abuse of data, which in turn can lead to higher returns.

1. Introduction

A brief introduction to the two most powerful frontiers of IT - Big Data ***Analytics and Machine Learning.*** These two modern approaches have become the main area of interest for top scientist, organizations, individuals and professionals in the Analytics domain. These real-world applications have been launched in the pursuit for preserving the useful data, efficiently manage and analyze the data, the aim being - improving business, decision makings, gaining an edge over the competitors for achieving certain business goals.

The unending flow of data in the organizations and the need to take calculated decisions for business growth has given rise to these two powerful applications that can make organizations capable of handling the massive amount of data with efficiency. It has been proved that these real - time applications have produced accurate results with negligible errors.

Every year companies gather and store a massive amount of both structured and unstructured data related - to customers, business processes, science, social science domain which are processed from platforms like social media, cell phones, transaction records, videos, and host of others. The huge amount of data collected from everywhere might become out of control and extracting useful data from this staggering database might give rise to serious complications and there's every chance of data being wasted and abused.

While it's a common knowledge that fraud, waste, and abuse is there in every industry like – retail, manufacturing, banking, healthcare, transportation, sports, automotive and others. Most of the fraud schemes go undetected leading to unimaginable loses. The losses caused by fraud incidents can create a repressive environment for the companies involved, making it difficult to pull out of the situation.

To monitor the growing threat of fraud, waste, and abuse of database it is necessary to pair powerful real- world applications like - Big Data Analytics and Machine Learning strategy to maintain, analyze and use data properly for a successful business return. It's a clear solution to tackle huge volumes of data, also called Big Data.

2. Uncovering Big Data Analytics

The concept of Big Data Analytics has been there for years, but only basic analytics was in usage. It's only now this real - world application has gained momentum, for it is a powerful approach that can influence business in a huge way. In broader terms, Big Data Analytics is associated with analyzing huge amounts of data, uncover hidden patterns, reveal relevant information from these piles of stored data which might give insight into the useful data that may provide new opportunities, help make important business decisions paving way for growth and success of the business.

3. The purpose of analyzing Big Data

The aim of analyzing Big Data is to discover hidden patterns and links which might provide useful information about the founder of the Big Data. It cannot be ruled out that the extracted useful information can reveal market trends, give deeper insight into customers details, could be helpful in making important business decisions, leading to business growth, and this is possible at faster pace and results are also accurate and it can be said all of this is out of catch of human analysts.

Importance of Big Data Analytics - *for a smarter business moves*

- Big Data refers to large volumes of structured and unstructured data, that is generated in companies' day in and day out. What Big Data does is help you extract relevant data that, can help you find ways to make better business moves which will only lead to growth and success.
- Big Data Analytics can prove to be a boon when it comes to extracting useful information from the massive amounts of structured, unstructured or semi-structured data.
- Big Data Analytics is an in thing; it provides huge benefits which can help you turn your business in a huge way. Big Data Analytics empowers all kinds of businesses whether big or small to make better decisions.
- Big Data Analytics can help organizations take relevant decisions which can prove to be profitable for the growth of the organization.
- Big Data Analytics helps organizations to work efficiently and make their presence felt in this competitive world.
- Big Data Analytics helps organizations track opportunities and work towards the growth and success of the organization.
- Big Data Analytics can help companies to understand customers expectations, likes, and dislikes. Once the companies are able to understand the customers' choices, it can help the them to connect with the customers and provide them their choice of brands and services, a big gain in business.
- Big Data Analytics need a series of systematic processing to derive useful information, which can be achieved by using latest technologies like ***Machine Learning*****.**

Top organizations across industries using - Big Data Analytics

- **Banking -** In the banking sector, there's a flood of various types of customer data and it keeps on adding to the already existing database. It is challenging to store these enormous data and be able to derive value from the stored data. But using Big Data Analytics, it is absolutely simple enough to store data, extract useful data and make better banking business decisions. It is well known that there's always a risk of fraudulent activities in the banking sector. But with fraud detection algorithms the incidence of frauds in banks has reduced drastically. In fact, there are several areas where Big Data can help banks to gather real-time insights that can help chalk out strategies to improve their performance and make transactions more transparent.
- **Healthcare -** Healthcare industry has significantly benefitted by using Big Data. It is a fact that the healthcare industry has to deal with large volumes of complex data. To extract useful data effectivel, an advanced and powerful approach like Big Data is essential, which will enable the healthcare organizations to manage and analyze patient - related data appropriately. Using Big Data Analytics has helped healthcare industry in a big way like - it has helped each doctor understand his/her patient's problem more deeply, detect disease and made it possible to provide the best suitable treatment for the patient.
- **Communications and Media-** Using Big Data Analytics in communication and media is the best decision that will lead only to the path of success. It works like this, well - planned marketing research forms the basis for the success of any brand, here data analytics guides you to segregate relevant and irrelevant data, this helps you to plan your marketing strategy in a better way that will yield good results for your organization. If you want to maintain your position in the communication and media sector you need relevant data the only key to success, as it allows you to design your strategy that will keep you ahead of your rivals and this can be achieved only by using smart data analytics that will pave way to the road of success.
- **Sports -** It is true, Big Data is increasingly influencing the sports filed. Sports -related data is being collected from every part of the globe to be used to guide the teams to win their respective games.

The benefits of using Big Data Analytics in sports are endless. For example - Wearable can become a guiding force for players, through which the performance of the players can be monitored, analyzed and improved. The massive data related to sports now collected can be useful in making sports - related decisions in a much better way.

Big Data Analytics has brought about a huge difference in the way businesses compete and operate. More and more companies are using Big Data Analytics to derive valuable data that will help them to make smarter and fact based decisions.

Advantages of Big Data Analytics

- The fact that Big Data Analytics has proved to be a robust platform for numerous companies is true, for it has guided them to make solid business decisions. But the most important advantage of the Big Data Analytics is that it has simplified the task of managing and analyzing business processes, leading to more profits.
- In businesses huge volumes of data is involved, there's is always a risk of taking wrong decisions when you are unable to get hold of useful data. But when you incorporate Big Data Analysis in your business processes, you'll only get access to complete and useful data, which can be a big advantage for your business.
- Using Big Data Analytics in your business can help you understand current market conditions, accordingly you can produce products which can reap benefits.
- Big Data tools like Hadoop and Cloud - based analytics have helped companies to save their expenses. It is known that it is very expensive to store, maintain and analyze Big Data. But using Big Data tools can help in identifying, managing and

processing data in a more efficient way and that too at a decent cost.

- Running a business in the past was a tedious job, the useful data was limited, it was very difficult to get the right information at right time, meaning businesses could only question and answer in a limited frame. But with the advent of Big Data Analytics platform things have changed in a massive way, but for good. Now, businesses can ask and also answer questions more quickly and find accurate solutions to every problem.
- Big Data Analytics has empowered companies to get useful data much faster, it has provided the best platform that has helped businesses make better decisions and move forward.

Uncovering Machine Learning

Machine Learning is all about preparing well-written intelligent computer programs that respond to real-time situations. In a clear context, Machine Learning refers to applying algorithms to make proper use of data, especially making computer programs that understand and responds to human intelligence. Machine Learning help companies manage, analyze and use their data successfully to produce reliable results.

A very good example on which Machine Learning technology is implemented is working on Facebook- in which Machine Learning algorithms works by collecting information about the conduct of every online user. It can help algorithms predict users past interest and accordingly recommend feeds through notifications and posts.

Application of Machine Learning in different fields

The application of Machine Learning is everywhere, which includes fields like - science, finance, stock trading, business, social media services, spam filters, robotics, data mining, online fraud detection, ad placement, and host of other fields. Machine Learning is an amazing revolutionary application that has made our lives much easier, as it influences the computers to predict the result and the amazing part is it does not need human intervention.

A brief look into the application of Machine Learning in the following fields.

- **Machine Learning in data mining -**Data mining refers to the usage of statistics and other programming ways to unearth the hidden patterns in the Big Data, with the intention to extract useful data which can help analyze the facts. The role of Machine Learning is to lend a set of tools and algorithms to uncover the happenings behind the data that can help predict future outcomes as well as contribute to decision making.
- **Machine Learning in social media services -**The application of Machine Learning(ML) to enhance social media services has been remarkably successful. ML has provided computers massive data sets that have helped in providing accurate information and solutions to the millions of social media users around the globe.
- **Machine Learning in the finance -**Application of Machine Learning in financial companies has proved to be the smartest way to improve business. ML works to enhance financial companies by processing and analyzing Big Data and prevent fraudulent financial activities. ML models help in extracting useful data, identify suspicious transactions, guides in predicting future trends and most importantly helps in taking better financial decisions.
- **Machine Learning in online fraud detection -**The implementation of Machine Learning in online fraud detection is the best thing that has happened in recent years. ML works by feeding algorithms that promises faster data processing, analyzing huge data, collecting useful data and also identify hidden correlations between online user behavior which might signal to possible fraudulent actions. The best part about the application of Machine Learning is that it has reduced manual work and most importantly it provided accurate results.
- **Machine Learning in the healthcare field -**Machine Learning application has proved to be a boon in the healthcare field its application has helped in extracting detailed information about the patient health details. Sensors are fixed in the wearable of the patient that helps detect a patient's heart condition, blood pressure, and overall health condition. With Machine Learning, it has become easy for doctors to analyze and predict the upcoming health problems of the patient.
- **Machine Learning in email spam and malware filtering -**Email spam refers to junk email, which can be filtered by the implementation of Machine Learning also to detect online threat like malware.

At this point of time, the Machine Learning approach is highly reliable, especially when the database is massive and diverse, for it uses completely generic methods that simplify tasks and the result obtained is also accurate.

Advantages of Machine Learning

- Machine Learning is a most sought after technology, a sub-field of Artificial intelligence. It is a boon to the business world for it helps to solve problems within seconds and also predict the future with accuracy.
- Machine Learning refers to a set of pre-made algorithms that are fed to computer to get acceptable output value.
- It is due to Machine Learning technology numerous organizations are able to improve their business process and have achieved their goals.
- Machine Learning has made it possible to carry on business tasks much faster and results obtained are also accurate.
- The pace at which Machine Learning consumes data and segregates useful data makes it possible for business people to make important decisions at the right time, which might add value to their business.
- Another interesting advantage of ML application is that it helps you analyze the data related to the past history of the customer, which can allow you to predict

the customers likes and dislikes, based on which you can render your services in the form of product recommendations.

- ☞ Another breakthrough of implementing ML programs in business is that it has produced error - free and accurate data that has added value to the business, unlike traditional technology where duplicate and inaccurate data were some of the major problems faced by the businesses.
- ☞ Machine Learning has the ability to keep the security of an organization under check, as cybersecurity is the major concern for most of the organizations, with ML technology this problem can be detected timely and effectively.
- ☞ Machine learning technology is being increasingly incorporated in organizations across the globe to decrease the workload of humans, which has drastically reduced operational and manpower costs.
- ☞ Another advantage of Machine Learning application in an organization is that it takes care of all the head breaking tasks that humans must carry out to achieve the required results. Since Machine Learning does all the tedious work, it leaves enough space for humans to explore their creative aspect. In a way, Machine Learning is a boon to mankind for it allows them to get their work done quickly.
- ☞ To sum up, Machine Learning technology is an intriguing concept. It has incredibly contributed to improving the business moves by helping to extract meaningful data from a massive load of raw data, that too at much cheaper and quick computational processing. That's why it has been massively used by some of the major technology giants like Amazon, Google, Facebook, Microsoft, and others.

We have seen the incredible advantages of Machine Learning application in our daily lives. Remember, these advantages are only likely to grow in the future. So it only makes sense to incorporate Machine Learning and Big Data Analytics in your business for it will surely provide you accurate results, leaving no room for errors.

Big Data Analytics and Machine Learning - *a game changer for FWA*

How Big Data Analytics and Machine Learning can shut down fraud, waste, and abuse (FWA)?

When there is an enormous database, there is definitely a risk of fraud, waste, and abuse of data. To tackle this problem using Big Data Analytics paired with Machine Learning the two new techniques, can be the game changers. These two new found strategies work very well to shut fraud, waste, and abuse of database in various sectors, let's take an example of the

Healthcare Industry.

Like any other industry, Healthcare industry is not free from fraud, waste, and abuse. Given the huge and wide volumes of data, it is hard to identify potentially fraudulent transactions and wasteful claims on a regular basis. Though it's a real task to shut FWA totally from the healthcare industry, it is not impossible. Those who have made big investments in the Big Data Analytics and Machine Learning technologies to root out FWA have had a satisfactory outcome. These two real-time approaches have helped various healthcare sectors to detect illegal transactions and saved an enormous amount of money and time.

Some of the most common errors that have gripped healthcare sectors are - false diagnosis, errors in billing, false medical reports, false claims, expensive medical procedures that aren't necessary and a lot more. These are some of the healthcare fraudulent activities that have lead to devastating effects on the patient population. But how do you clean up fraud, waste, and abuse in the healthcare industry? To tackle this problem Big Data Analytics and Machine Learning techniques play an important part in dealing with FWA in the healthcare industry. With the aid of Big Data Analytics, it is easy to analyze the huge volumes of data, identify hidden patterns that help detect and eliminate fraudulent claims that too within a short time. While the Machine Learning technique can help shut of FWA much faster, help achieve better accuracy and flexibility providing huge benefits to healthcare system. The combination of Big Data Analytics and Machine Learning techniques can help analyze the healthcare data from multiple perspectives that can aid in detecting suspicious activities and eliminate FWA in the healthcare system to a great extent, a definite way to achieve transparency in healthcare services.

Remember, using Big Data analysis and Machine Learning does not wipe out fraud, waste and abuse problem completely because these problems are always there, but fortunately using these two techniques have helped numerous companies tackle FWA and move forward in their business.

Application of these two strategies in businesses have provided impressive accuracy, made tasks much simpler and enhanced business opportunities to an unbelievable extent.

Machine Learning and Big Data Analytics - *The Real-World Applications*

ML is a part of data science that has rendered assistance to businesses to examine large and complex data to tap hidden patterns, identify the customer choices, and explore latest market happenings which can help in devsing the strategies that will contribute to the growth in business. Now, organizations are getting to understand that incorporating Machine Learning and Analytics in their business is the best move to derive useful data to gain business objectives.

4. Conclusion

Modern Companies are now doing smart business by reshaping the infrastructure that supports new and powerful approaches like Big Data Analytics and Machine Learning, that not only enhances the business but also helps drive a long - term business value. With solid computational power, Machine Learning system has lead many companies to the path of success.

It is strongly believed that Big Data Analytics and Machine Learning are the best smart discoveries, which helps identify authentic and unauthentic data from the massive database, this

in turn, can help organizations to get insight into useful data, utilize it effectively that can improve decision making and stay ahead of the competitors.

What's particularly interesting is that though there's no direct relationship between Big Data and Machine Learning when they are applied together these two can do wonders. While Big Data Analytics supplies Machine Learning with data with an intention to get best out of it, meaning you need ML to get the best out of Big data, so as to make better decisions, which might turn fortunes for your organization. The amazing part about ML is that once designed they need no human intervention, cause Machine Learning is a science of algorithms which is intelligent enough to learn by itself, they just need huge chunks of data, which is provided by Big Data Analytics the result you get is real, reliable and highly effective to make strategic business decisions that support your business goals.

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