Data: The New Currency

Today everywhere people are talking about Data. Data is the new currency of today's economy or we can say data is the electricity of the new economy. So we have a question here: Why data is so important? The best answer is, data is everything. Every human being including you and me are data. Everything we do- going for shopping, talking to a friend on phone, booking a hotel room on vacation, ordering a meal are all incorporated in data. All these information tell what kind of person are we, what are our preferences, our likes, dislikes. Like money, it can flow easily across geographies and it commands an intrinsic value — the insight generated from data helps deliver benefits to individuals, businesses, and governments alike.

However, Raw data is not powerful. It is valuable but it need to be cleaned first just like crude oil which is very expensive but of no use if unrefined. We should know actually how to convert this raw data into useful information.Hence, data needs to be analysed first in order to have value.The biggest challenge today is how to convert this huge raw data into valuable information and make actionable decisions?

Big companies are investing huge amount of money on this data to get useful information about their customers so that they can provide them amazing experience and recommendations. Technologies such as Artificial intelligence, specially natural language processing and machine learning are an important tool to get amazing information out of this data. Companies have petabytes of data and artificial intelligence is helping them to make sense out of it. Brands like , , are using Artificial Intelligence to better scan the data and offer personalized recommendations. The more AI, ML and computers performance improve, the more sense data will give.

Large companies are investing in ML and AI to give amazing experience to their customers but on the other hand this data can also be used in an adverse way which we never thought of.

As we all are aware of the world's biggest social network, Facebook's allegation that it provides data to Cambridge Analytica and which has been used in Donald Trump's online campaign. They manipulate the individual's opinion by showing them customised messages. Facebook needs to be much more transparent to its users that how they are using their personal data. This issue breaks trust of many of the facebook users and raised a questions about the exposure of our personal lives on social media. We should keep in our minds that giving personal information each time when we go to the internet is nothing but expose ourselves to potential traps.

In this type of environment, it is quite crucial to protect the personal data. Different countries are coming up with new rules to protect their data. EU come up with General Data Protection Regulation that came recently on 25 May 2018. This regulation gives more rights to individuals to protect their data. Now individuals will be given clear frequent notice from organisations that they are collecting their data. Also, organisations need to tell the individuals how their personal data will be used. GDPR makes its simple and easy for individuals to make their data restricted or erased.

Individuals should also take care of their personal data for example:
- Encrypt important data and device.
- Also have PIN or password for personal devices.
- Enable two factor authentication.
- Customise the privacy setting of social media accounts e.g how can see your content, or remove account from Google search results.
- Use different passwords for different accounts.
- Don't click on any link on phishing emails.
- Restore old devices to factory settings before giving them away.
- Opt out of ad tracking so that you can't see any personalised ads based on your online activity.
- Be a little bit more alert while using public wifi.

With the right strategy and infrastructure, the potential to monetize data has never been easier. It's just a case of recognizing the value of data and putting insight-driven actions into the heart of the enterprise. Insights derived from the smart use of good quality data are very powerful. Brands and companies that are able to develop actionable insights, from any level of data will be winners.

Machine Learning Simplified
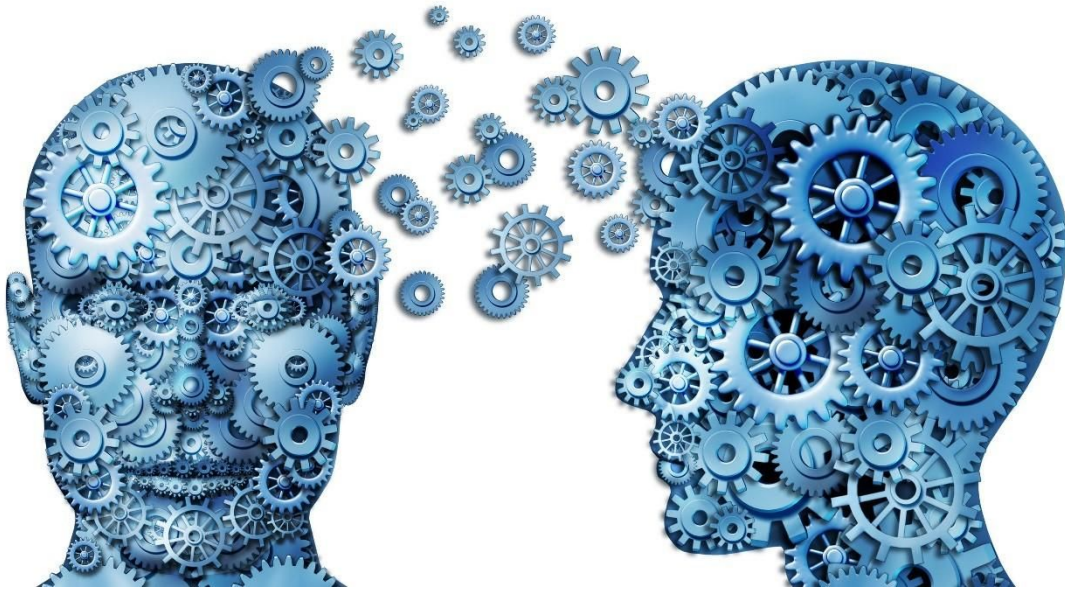
From automating mundane tasks to offering intelligent insights, companies in every sector are talking about Machine Learning as it is driving and creating tangible business value for a diverse range of industries, but only if used in the right way.

Machine Learning Algorithms and its diverse capabilities and platforms are helping lots of industries to develop new business models, improve the quality of their products and services and optimise their operations. For example:

- ***Amazon uses machine learning to offer personalised services to its customer based on purchase history.***
- ***Siri uses machine learning and deep learning to understand human language.***
- ***Facebook started recognising similar faces.***
- ***Google introduced smart reply function to Gmail for quick reply.***

Even though Machine Learning is very topical, still many don't have a true understanding about what Machine Learning and AI is all about. This post is for those who are curious about machine learning and AI and are wondering about its magic.

What is Machine Learning?

Machine Learning is a subfield of AI that gives system the ability to learn and improve from experience. AI is a branch of computer science which emphasise on making smart machines to think and work like humans. In traditional programming, data was used for writing programs in order to get the desired output. In Machine Learning, there are few generic algorithms that show interesting facts about the data. For these algorithms, we don't need to write any specific code, data plays a key role here and based on the type of data, the

algorithms make its own logic. For example, Classification algorithm, which classifies the data into various groups. Few examples are:

- ***to classify text based on different emotions (positive, negative, neutral).***
- ***to classify email as ham or spam.***
- ***to classify articles about sports, movies, politics etc.***

Types of Machine Learning Algorithm

Supervised Machine Learning
In supervised machine learning technique, the dataset should always be labelled. There is a relationship between input and output. The problem you solve using this technique is to predict the output/ labels for data points without a label e.g. classifying email as ham or spam. The learning model also compares its output with the correct output and improve accordingly.

Unsupervised Machine Learning
In unsupervised machine learning technique, the dataset is not labelled. This algorithm can't figure out the right output, but it divides the data into various clusters and structures having different properties.

Semi-Supervised Machine Learning
Semi-supervised falls in-between supervised and unsupervised machine learning as it uses both labelled and unlabelled data for training.

Reinforcement Machine Learning
It is a kind of machine learning algorithm in which the machine and software agents get a delayed reward for its previous action in the next step. To maximize agent's performance, this method helps in automatically identifying the ideal behaviour in specific context. Mostly used in games e.g. Mario.

5 Basic Steps in Machine Learning

1.Data Collection
Data Collection step is the first and most important step in machine learning. In machine learning data is very important. An excellent quality and quantity data with a decent algorithm gives far better results than a powerful algorithm with less data. The better the quality of the data, the better the learning process of machine learning will be.

2. Data Preparation
This phase includes all the activities to process the data to make the final dataset for the modelling. This is also known as Data pre-processing. It includes data analysis, data cleaning, variable selection, fixing issues like missing data and handling outliers etc.

3. Training the Model
This step includes finding the best algorithm and data representation in the form of model. In this step the data is divided into two parts- training set and test set. Training set is to train the

model and test set is to evaluate the model.

4. Evaluating the Model
Next is the evaluatation of the model before final deployment and involves examining of all the steps to make sure that the algorithm and approach is 100% correct. After this the next step is to check the accuracy of the outcome.

5. Improving the Performance
Finally, a key component is improving the model further by feature engineering or by introducing more variables.

Machine Learning helps to analyse huge amounts of structured and unstructured data. Machine learning is very useful in getting faster and accurate results. Today, in this competitive world, businesses are not only satisfied with the solution to problems like: did we generate the required revenue for this year, did we achieve our sales target or did we target the correct customers etc., a huge emphasis is to know the likelihood in the future and the probable outcomes and Machine learning is definitely a potential solution for this.

Cognitive Computing: Future of Artificial Intelligence.

Long before it started, 2017 was being heralded as the year of AI. Each and every news encompassing automation, healthcare research and digital assistant only increased the expectations while overlooking one critical fact which has remained overclouded in all of the zeal for social transformation ascribed to cognitive computing's prowess. Prakash Nanduri CEO of Paxata stated that " *people in the industry say that if they can do cognitive computing, they can solve cancer*". But, the key lies in transforming the data into relevant information.

Cognitive Computing, Artificial Intelligence and Machine Learning are the three buzz words of today's IT era. From smart homes, to self driving cars, to digital assistants, we have seen that machines can speak, hear, write, read and learn but the main question is can they understand? Can they make their own decision? Can they respond without being pre-programmed?

Cognitive Computing

Cognitive means "to think" and "computing" is processing using computers. Cognitive computing is making computers smart enough to think like humans. Cognitive computing is not a one single technology but it is a group of powerful technologies like artificial intelligence, machine learning and natural language processing. It uses AI and ML to generate powerful system which can sense, learn and respond. It plays a critical role in advancing and automating the core tenets of data management such as data modeling, data quality, data transformation and integration to ignite the applications and analytics required for the data. Researchers are claiming that Cognitive Computing is more powerful than Artificial Intelligence. Cognitive

computing is basically designed to solve problems like we human beings do. IBM defines Cognitive Computing as " *systems that learn at scale, reason with purpose and interact with humans naturally*."

Cognitive computing is not only replicating human brains but also trying to create a system that handles huge amount of data because human brains can't remember humongous data. In the last 2 years, the 90% of the data which is present in the world today has been created and most of this data is unstructured. So, we can guess how much data is creating everyday and how massive it will be in coming days. Cognitive computing is basically designed to handle this huge amount of unstructured data. To understand unstructured data, we need more intelligent and smart systems and Cognitive Computing is one such effort.

Cognitive computing is useful in any field where massive amount of complex data needs to be analyzed and processed for example finance, retail, education, supply chain, manufacturing, healthcare, aviation etc.

People often get confused between AI and cognitive computing. The personal digital assistant which we use in our day to day lives such as such as Amazon's Alexa, Apple's Siri, Google Assistant, these are not cognitive systems. They all have pre-programmed set of instructions or responses and they only respond to limited number of requests. But Cognitive computing make system smart enough to think and respond without pre-programmed set of instructions.

Artificial Intelligence (AI) is making computers smart to do intelligent things. The roots of AI are machine learning algorithms, statistical data analysis, deep learning neural network and many more. In AI a model has been provided with long period of historical data so that it can learn from the input and output variables and provide a solution. AI uses machine learning algorithms that learn from historical data and make predictions.It can also decide what actions to take and when. As compared to traditional programming where programmer use to write set of rules or instructions, in AI the algorithm trained itself by finding out patterns in large volume of historical data. Deep learning neural networks are much more stronger and smarter than machine learning as they have layers where the output of one layer is input to another.

E.g Amazon recommendation system, Google voice assistant, Apple Siri, chatbots
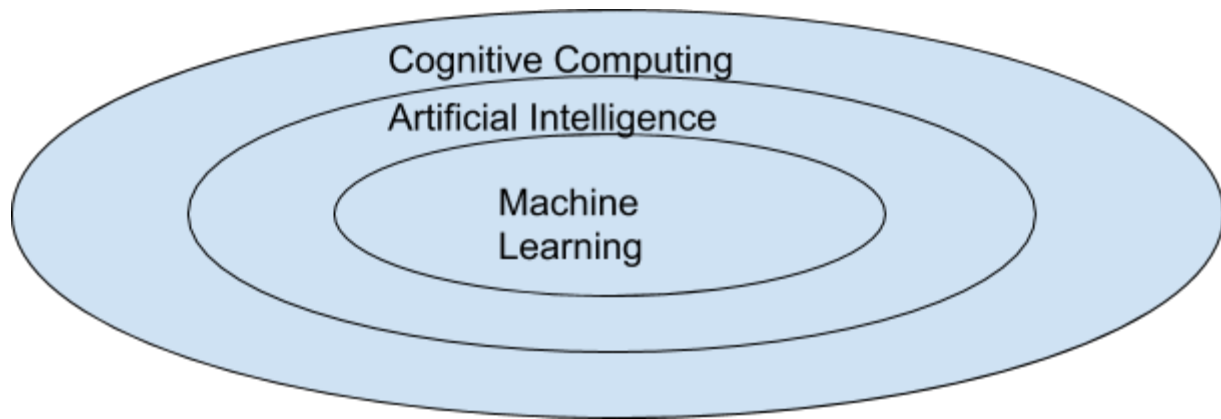
Cognitive Computing is a step ahead of Artificial intelligence.Cognitive Computing includes artificial intelligence, machine learning and natural language processing. These systems are self learners, after giving initial instructions they start learning by their own, based on the data they get. It is making computers think like human beings coupled with high computational power and memory.The main goal of Cognitive systems is to provide assistance to humans without their assistance. A potential use of Cognitive systems can be in a call centre where customer service representatives are getting assistance from Cognitive system to improve their offerings and services to the customers and hence, the customers are getting better assistance too.

The ability of the Cognitive Computing to absorb different characteristics of data and to comprehend, analyse and learn from it has the potential to unveil novel insights. These potential solutions can play an indispensable role in different areas of the industry especially in life science and medical healthcare which are in dire requirements of accelerated and radical innovations.