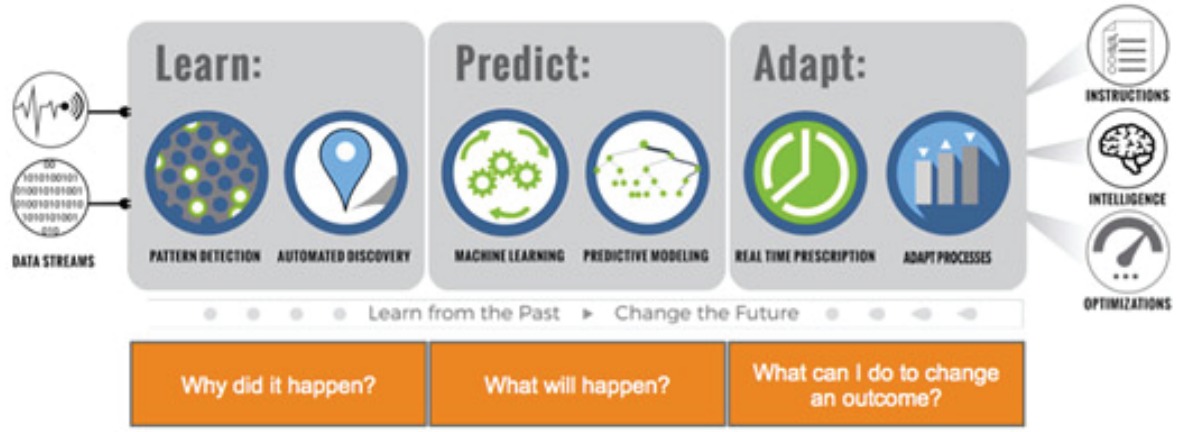
SYSFORE TECHNOLOGIES

MACHINE LEARNING - A POWERFUL CLOUD BASED ANALYTICS SERVICE

Machine Learning is a way for machines to analyze the collected data and provide a best possible solution to the problem. It focuses on machines having the ability to teach themselves, to grow and change when exposed to new data.

It should not be confused with data mining, where the result of data analysis is used for human understanding. In Machine Learning, the result is used to improve the program's own understanding. Machine learning programs detect patterns in data and adjust program actions accordingly.

As machine learning helps predict the future, it's often included in the broader category of predictive analytics. All that is needed is the data, machine learning software to learn from that data, and people who know how to use that software.



A popular example can be the Spam filter. The machine learning algorithm, will modify its program based on which mail the user marked as spam. It will constantly improves its algorithm, to provide a better filtering mechanism, based on the content, what action you have taken on a spam mail, the specific words in the content.

The overhead of machine-learning systems is typically huge. But today we have the option to place these systems in the cloud. Amazon Web Services, supports machine learning using AWS's algorithms to read native AWS data (such as RDS, Redshift, and S3). Microsoft provides an Azure machine-learning service.

Amazon Machine Learning and Azure Machine Learning (Azure ML) are both cloud service that helps people execute the machine learning process. As they both run on a public cloud platform, the ML software can work with very large amounts of data and be accessed from anywhere in the world. Using it requires just a web browser and an internet connection.

How is Cloud influencing the Machine Learning curve?

Machine Learning is a fully managed, on-demand, pay-as-you-go and easy to use service provided by prominent cloud providers like Amazon Web Services, Microsoft Azure and Google Cloud Platform. The cloud-based Machine Learning service gives business a chance to get started with Machine Learning and make valuable decisions.

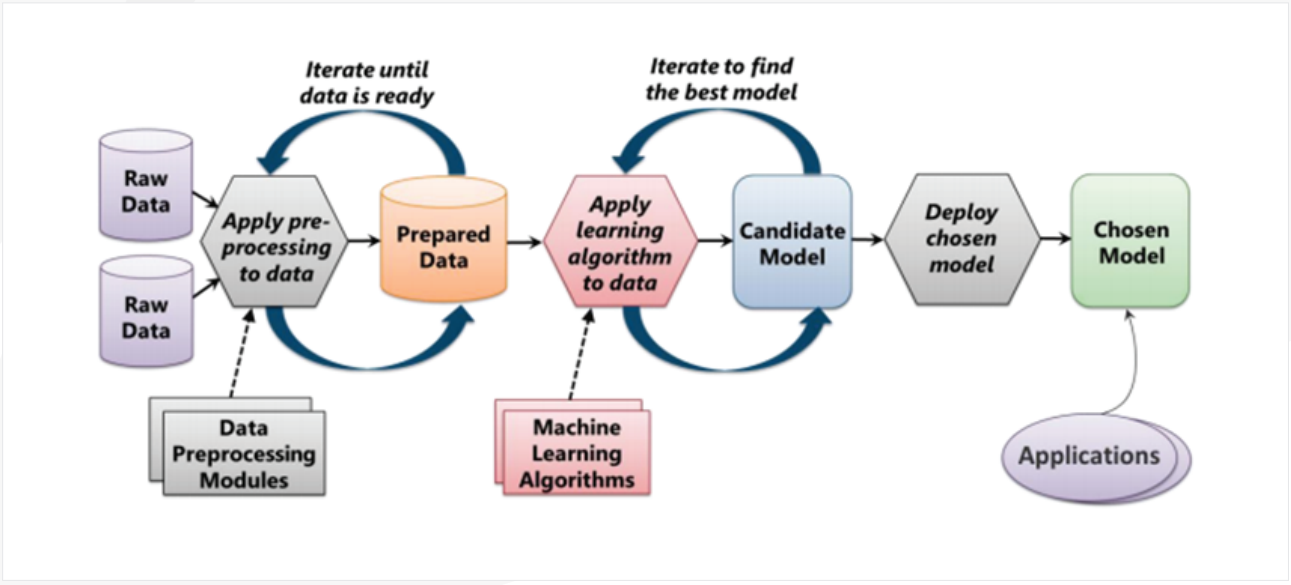
Today, data collected from businesses, organizations, and enterprises are not restricted to sensors and instruments. It is from web pages, relational, databases, spatial data, contextual, and behavioral data. This vast amount of data needs to be analyzed to generate a predictive analysis and solution.

The machine learning process is time consuming, requiring scalable and fast computing power. The Cloud computing model and cloud providers provide the required environment for resource sharing in terms of scalable infrastructures, middleware, application development platforms and value-added business applications.

The growth of the Internet of Things (IoT) has also been helped by the cloud, as apps and services need a central location to pump all of their data into before it can be analyzed and utilized, as well as accessed and controlled.

The fall in cloud storage prices, has make it easy for small businesses and many industries to adopt the cloud computing power for machine learning. This will lead to more cloud providers offering machine learning as a service products and IoT management services to give users a way to centralize and make use of all their data.

Machine learning process:



As the above figure illustrates, the whole machine learning process begins with the collection of the raw data. This raw data is not suitable to be used in its present form.

The following steps are applied to this raw data until a final model is developed on which the applications can work on.

- Preprocessing of raw data - The raw data is processed by the various preprocessing modules until a suitable prepared data is available. This is an iterative process, until the best fit of the prepared model is developed.

- Machine Learning algorithms are then applied to this prepared data until the best possible solution is found to solve the problem they're working on. These algorithms typically apply some statistical analysis to the data. This includes relatively common things, such as a regression, along with more complex approaches, including algorithms. The goal is to determine what combination of machine learning algorithm and prepared data, generates the most useful results.

- The result of applying this machine learning algorithm on the prepared data is referred to as a Model. A model is code, it's the implementation of an algorithm for recognizing a pattern. It gives the solution to the problem.

- An algorithm is then implemented by the model itself to provide a solution that actually solves the problem. The result of the problem is returned in terms of probability between 0 and 1. Depending on the organizations business decisions, suitable actions are taken on the problem.

Note: The machine learning algorithm is applied on the prepared data, and the goal is to create a model. The algorithm implemented by the model itself provides a solution that actually solves a problem. They are two different concepts and should not be confused.

- Deploying the Model - The generated model is of no use, if this cannot be deployed to the cloud and used by the applications. Both Amazon and Microsoft Azure have various APIs which can be used for deployment.

Basically you select a model which uses the APIs to expose its functionalities to the application and obtain the results. For effective and efficient functioning of the model, it needs to be redeployed and recreated, as new data is constantly being added. For this to occur, you need a fast deployment system in place in the cloud.

If this process is slow, it may result in the businesses stuck with old models, which will affect the businesses.

Benefits of Machine Learning in the cloud

Powerful computing power - Being deployed in the cloud enables the small and medium businesses to leverage the cloud benefits. They can simply select the machine learning solution which suits their business needs and deploy it, without worrying about setting up the required infrastructure or developing resource intensive applications.

Big Data Analytics - The vast amount of Big Data collected by the enterprises is impossible to be analyzed through the traditional analytical tools. Using the Machine learning capabilities, allows them to target huge uncategorized and unstructured data. It allows the data analysts to come up with patterns and predictions based on samples taken from this vast and diverse data, and use algorithms to come up with accurate and tailored results.

Flexibility - Modeling and data mining projects come in all shapes and sizes, but typically, in setting up an in-house solution, cost considerations limit processing power to projects of average size. You can plan for bigger projects when using the cloud.

Cost Effective - Budget is not a constraint as the cloud model allows you the Pay-as-you-use pricing model. You can meet all your analytics of the BIG DATA requirements on a small data budget. Or let other business units manage their requirements on their small budget!

Better insights for businesses - Using machine learning, businesses can make predictive analysis on the collected data to take correct business decisions.

Sysfore can help you to incorporate Machine Learning in your cloud implementations in a secure, and seamlessly manner. For more information, you contact us at **info@sysfore.com** or **call us at +91-80-4110-5555**.