ROLE OF BIG DATA ANALYTICS FOR EFFICIENT MANUFACTURING PROCESS

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Abstract : The manufacturing process is growing due to the development in procedure and computer technology. These modifications have been shown in digital manufacturing of today as compared with flexible manufacturing of three decades ago. The large volumes of data generated by the manufacturing processes. This data can be used in various aspects of manufacturing for improving the consistency of the manufacturing processes, equipment failures prediction, designing of manufacturing equipment, and discover new technologies with the help of this historical data. This paper will focus on the different aspects of manufacturing where big data analytics can apply for improvement.

IndexTerms - **Bigdata analytics, Business intelligence, Machine learning.**

I. INTRODUCTION

Now days organisations are facing the challenge of individualizing their process of business in the marketplace. Each business process execution included the presently existing processes and business environments. Due to era of Internet of Things digitalization comes in the existence that allow an unprecedented insight into business [1].

In future only those companies will survive those will conduct their business activities after analyzing rapidly generated data ,follow the appropriate process flow and control process driven by knowledge generated due to analysis. Predictive enterprise is the next evolution in decisive competitive advantage[1][2].Each business getting large amount of data with different sources for efficient use of those data a strong Process Management is required[3], Often this is required because this large amount of data is not processed in timely manner to make right decisions due to lack of technical capacity. If companies will not discover any suitable business process model for anticipate this problem then they will face difficulties in business process and failures in a timely manner[4]. So a technique is required that identify problems, predict the future progress and analyze the current process executions to take appropriate actions, but techniques those used in predictive analysis involve the risk analysis to forecasts of process progressions it not consider the contextual situations for their analysis.

While the available datasets are constantly increasing with enhanced detection capabilities and providing unprecedented process information, there is a requirement of an approach that can analyze this huge amount of data and recognize the full prospective of available data.

II. CHALLENGES AND ISSUES

To improve a process, one must understand its behaviour .However, the rate of changes is increasing day by day that required to develop new techniques that accept this challenge and improve manufacturing process. Traditional approach for improvement having following two main challenge

   (a) Number of parameters those effect the process of manufacturing should be measured and the size of the data must be analyzed for improvement.
   (b) Variations process should not compare variations by predefined rules due to dynamic nature hence it requires changes in the rules.

Since business is dynamic in nature so it generate data rapidly this big data can be used to model the process behaviour. Using unsupervised machine learning approach for processing of large data can improve the performance of manufacturing ,To detect anomalies in big data approach following three requirements must be met

S1: Precision: It will focus on the similarity like how to define what is similar?
S2: Interpretation: how to understand why something is not the same?
S3: Scalability: It will focus how calculate result quickly using as much as possible of the data

III. ADVANTAGES

A large data use case provides analysis orientation, It specify parameters for data types that can be helpful to determining how to model these data using big data analysis. Following are the advantage of big data analytics in manufacturing

a. Improve manufacturing processes

b. Customized product design

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c. Better quality assurance

d. Supply Chain Risk Management

A manufacturer uses Big Data to reduce the risks associated with the delivery of raw materials, no matter what happens in the supply chain. Predictive analytics permit the organization to calculate the probabilities of interruption. The company uses the results of the analysis to identify relief providers and develop contingency plans to ensure that production is not interrupted by a natural disaster. Big Data analysis can be used to   solve any manufacturing problem.

IV. CONCLUSION

The most important manufacturing challenges is continuous process improvement is that it requires new knowledge about product behaviour and quality control process to recognize the potential for improvement. With the rapid advancement of information and communication technologies   and the integration of advanced analytics in devices, manufacturing, products and services, manufacturers face new challenges like skills, increase the efficiency of production, improve the quality of production, reduce costs. Large data analytics become the foundation for manufacturing areas such as forecasting, proactive maintenance, and automation.

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