International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 07 | July 2020 www.irjet.net p-ISSN: 2395-0072

Flexibility Analysis using Machine Learning Models

Vaishnav Ramayan[1], Prof.Sushmitha N[2]

[1]Department of Information Science and Engineering, RV College of Engineering, Bengaluru, Karnataka, India.
[2]Professor, Department Of Information Science and Engineering, RV College of Engineering, Bengaluru, Karnataka, India

---

Abstract - *Flexibilty Analysis is a technical term to depict the Demand Planning for any product which is associated or subjected to sale in a live market. It plays a vital role to organise and plan the supply chain management of a company. Forecasting means to predict the future performance of the product depending on the historical data which is technically referred to the term Actuals in throughout this project. The product is uniquely identified using a term SKU which stands for stock keeping unit, it is the aggregation of customer group, material and region and acts as any other barcode while the data is being identified and treated uniquely. The trivial data which has being worked upon is received from a petrochemical giant in the present industry and they seek to improve the accuracy of the present forecast which was low on confidence and had a poor fit.*

Key Words: *SKU- STOCK KEEPING UNIT SCM- SUPPLY CHAIN MANAGEMENT SSIS- SEQUEL SERVER INTEGRATION LANGUAGE IBPL- INTEGRATED BUSINESS PROGRAMMING*

1. INTRODUCTION

Supply Chain Management is commonly referred to the use of processes and techniques used to maintain the continuous flow of goods and services over different areas for different time intervals. Making sure that no demand goes unmet or delayed. Every industry heavily relies on their Supply chain management methodology to keep their daily processes going. They must deal with huge datasets to keep track of everything. Hence, the client need tools which they can use efficiently to their advantage to maintain their data base and also view the data in the required format to make necessary decision for their company. One such tool is the proprietary cloud- based AI platform known as MPower. This tool can be configured to the needs and requirements of any client and can be used for many purposes.

1.1 Problem Statement

As the current scenario Supply Chain management takes up an important role and calls for a serious research attention as the companies need to find methods to meet the demands of their customers at a manageable cost. To do so companies are in need to search the parts of their supply chain which has not been streamlined or is unnecessary and adds up to the total cost of production and distribution. They also need ways to visualize their network and understand the shortcomings in it. Previously manufacturers used to be the drivers of the supply chain, but the shift of focus has been made on the customers and their needs. Hence there is a shift of focus on the customer demands for options/styles/ features and methods are being adopted for their fulfilment and fast delivery. In Practice, almost all the supply chain-based companies (i.e Walmart, Samsung, DELL, Amazon, Flipkart etc) use different tools available in market to manage and support their supply chain strategies. A management system has many capabilities which include different processes, identifies measure, defines the outcome and visualize the current state.

1.2 Role of Data

It is a world of internet which is run by data. A digital supply chain is a means to store and manipulate data stored for the intended purposes. A company can have millions of records which are to be accessed daily. They require a method for storing and manipulating this data. A company has multiple divisions inside the company that take care of a specific tasks. These in terms of supply chain managements can be classified as planners. There are demand planners and supply planners these work in collaboration with each other and certain data is shared between both for their tasks. They work in collaboration with other and get inputs from the business development and operations team as well.

2. Scope

Flexibilty Analysis is, without a doubt, one of the most important part of any organization Supply Chain Determines the estimated future demand and sets the amount of readiness required on the supply side to match demand. The input and output sensor that passes through it are equally important for generating the right forecast and determining Forecast Accuracy.

A unique model that not only pre-processes the input data, but also integrates the output of two complementary linear forecasting engines that use Machine Learning algorithms and Time-Series algorithms to generate future predictions. This method is used by data-driven mathematical techniques to clean up the details of any errors or vendors and calculate the missing values if any. When the forecast appears, it is sent with Seasonality and Trend adjustments, if needed.

Fig 1.3 Quad Plot

2.1 Specific Requirements

This section covers all software requirements with sufficient details to be made use of by the designers to build a system to satisfy requirements. The product perspective and user characteristics do not state the actual requirements needed that the system but rather state how the product should work with respect to user convenience. The specific requirements are actual data with which the customer and software provider can agree. The final system is expected to satisfy all the requirements mentioned here. This section contains software requirements to a level of detail sufficient to assist designers to design a system such that these requirements are satisfied. It also helps design test cases to confirm that the system satisfies those requirements.

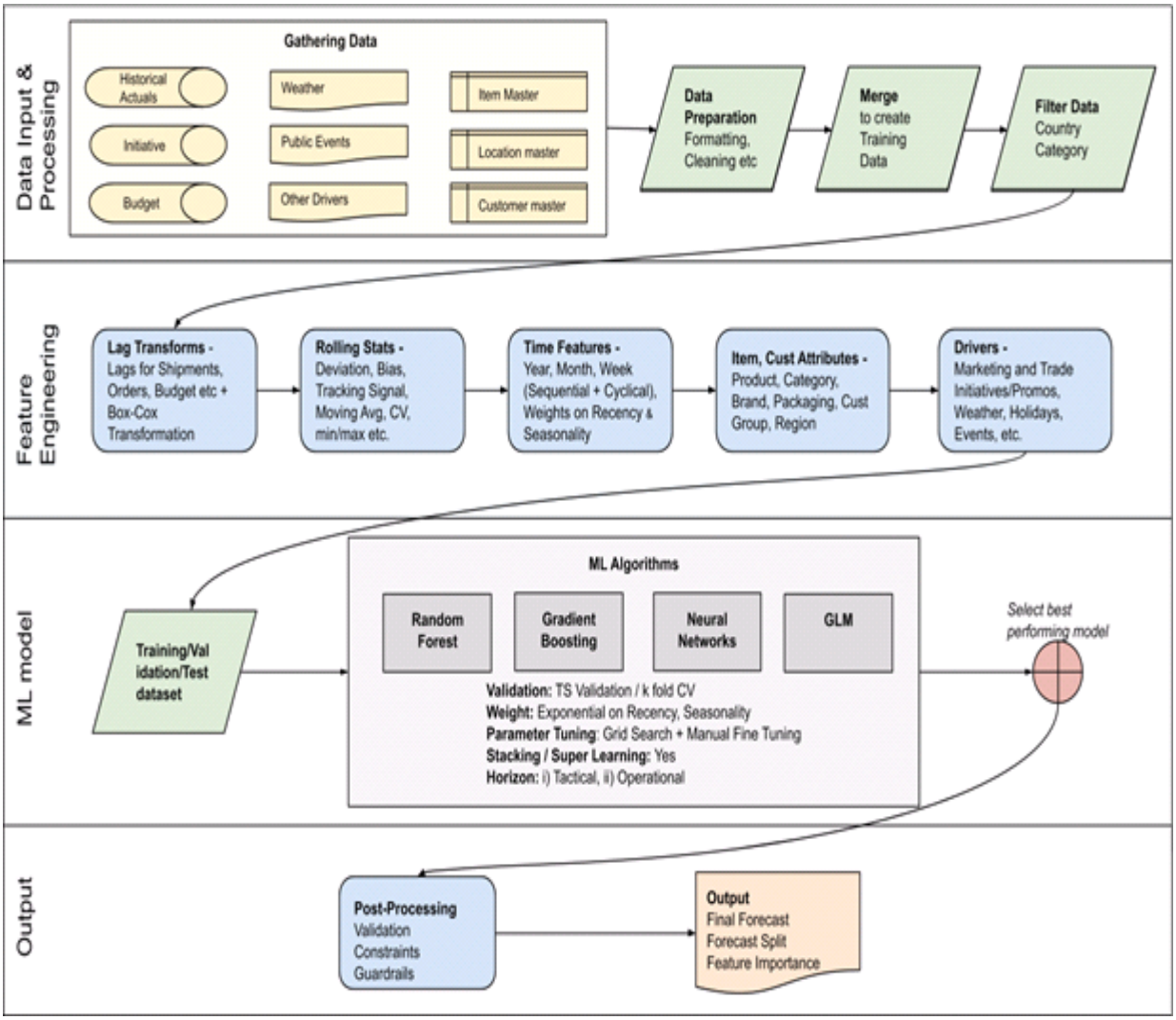

Chart -1: Flow Chart of Flexibilty Analysis Using Machine Leaning Methods

- Native support to the two biggest data science platforms - R and Python
    - Access to the largest library of algorithms for Statistics, Simulation, Machine Learning and Deep learning
    - R - forecast, prophet, tsintermittent, caret, nnet, H2O
    - Python - NumPy, Pandas, Scipy, Scikit-Learn, Keras, H2O
    - Plug and play architecture

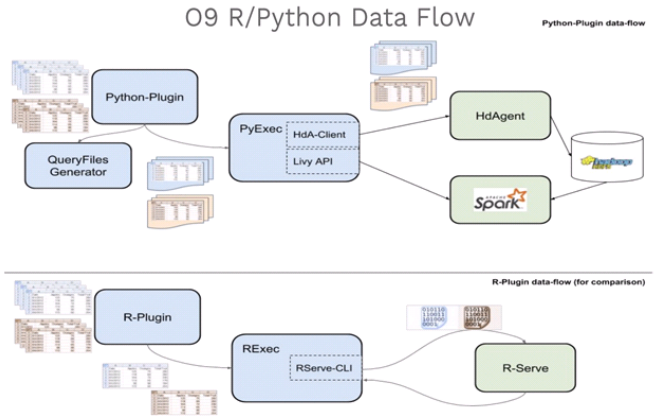

Chart -2: Python execution Model

- Allows to simply copy-paste existing python/R models, load libraries, invoke scripts and see results within the o9 user interface
- Designed for parallelization and scalability
- Integration with Hadoop ecosystem (HDFS, Hive, Spark)

3. CONCLUSION

This chapter includes the general experimental process to increase the accuracy, which starts with evaluation metrics, experimental dataset and performance analysis wherein the segments are being tested individually to improve the overall accuracy.

REFERENCES

- [1] Punam Khobragade, Roshni Selokar, Rina Maraskolhe Prof.Manjusha Talmale, "Research paper on Inventory management system", Department of Computer Science and Engineering, G.N.I.T., Kalmeshwar Road, Nagpur, Maharashtra, India International Research Journal of Engineering and Technology (IRJET), Vol 5, Issue 4, 2018
- [2] Mohamed Awwad, Pranav Kulkarni, Rachit Bapna and Aniket Marathe, "Big Data Analytics in Supply Chain: A Literature Review", Proceedings of the International Conference on Industrial Engineering and Operations Management Washington DC, USA, September 27-29, 2018
- [3] Aziz Muysinaliyev, Sherzod Aktamov, "Supply chain management concepts: literature review", IOSR Journal of Business and Management (IOSR-JBM), Volume 5, issue 6, Jan 2014
- [4] Shilpa Parkhi, Sourabh Joshi, Shubham Gupta, Mridul Sharma, " A Study of Evolution and Future of Supply Chain Management ", AIMS International, Volume 9, Number 2, May 2015