SHIPMENT TRACKING PROCESS IN SUPPLY CHAIN VISIBILITY

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ABSTRACT:

The paper mainly aims about shipment tracking process in supply chain visibility. Supply chain visibility (SCV) is the ability to track individual components, sub-assemblies and final products as they travel from supplier to manufacturer to consumer.SCV is enabled by supply chain management technology, which provides near-real-time data about logistics and supply chain operations.The algorithm used here for analysing the data is Linear regression and it helps to improve the delay of shipment process

Keywords: shipment tracking, Linear regression, supply chain visibility, delay , bar plot

I.INTRODUCTION

The paper is about shipment tracking process in supply chain visibility. Tracking shipments enables you to better serve customers by knowing the status of a shipment in the transportation process. When you track at the shipment level, you inquire on the status of an entire shipment, which includes all of the pieces within it. Having real-time visibility into the entire supply chain enables you to make rapid decisions about changes in schedules or working with alternate suppliers to ensure stable supply. You can also proactively notify customers so they can postpone sales or issue rain checks to their customers. Artificial Intelligence has become prevalent recently. People across different disciplines are trying to apply AI to make their tasks a lot easier. For example, economists are using AI to predict future market prices to make a profit, doctors use AI to classify whether a tumor is malignant or benign, meteorologists use AI to predict the weather, HR recruiters use AI to check the resume of applicants to verify if the applicant meets the minimum criteria for the job. .The algorithm used here for analysing the data is Linear regression and it helps to improve the delay of shipment process.

II. REVIEW OF LITERATURE

In today's competitive world, performance measurement of the supply chain is the key for effective supply chain management. The performance measurement can be utilized to describe and review the historical performance, as well as to set performance targets for the future. This paper aims to address the dearth of research in performance measurement systems and performance metrics of supply chain by reviewing the contemporary literature[6] How much of this supply chain needs to be managed depend on several factors including the complexity of the product, the number of available suppliers, and the availability of raw materials [5]

Academic and corporate interest in sustainable supply chain management has risen considerably in recent years. This can be seen by the number of papers published and in particular by journal special issues. To establish the field further, the purpose of this paper is twofold. First, it offers a literature review on sustainable supply chain management taking 191 papers published from 1994 to 2007 into account. Second, it offers a conceptual framework to summarize the research in this field comprising three parts. As starting point related triggers are identified. This allows putting forward two distinct strategies: [1] supplier management for risks and performance, and [2] supply chain management for sustainable products. It is evident that research is still dominated by green/environmental issues. Social aspects and also the integration of the three dimensions of sustainability are still rare.

Both practitioners in companies and academics might find the review useful, as it outlines major lines of research in the field. Further, it discusses specific features of sustainable supply chains as well as limitations of existing research; this should stimulate further research.Supply Chain Management (SCM) maximizes profit by integrating three key flows across theSupply Chain Management (SCM) maximizes profit by integrating three key flows across the boundaries of the companies that form the supply chain: flow of value (product/materials), information, and funds[4]. Successful integration or coordination of these three flows produces improved efficiency and effectiveness for business organizations. In theory, supply chains can work as cohesive, singularly competitive units similar to a large, vertically integrated firm, without

significant financial investments by the members of the chain[3] The basic difference between vertically integrated firms and a supply chain is that firms in a supply chain are relatively free to enter and leave supply chain relationships if these relationships are no longer proving beneficial.[7]

III. METHODOLOGY

A. Linear regression

In linear regression, the relationships are modeled using linear predictor functions whose unknown model parameters are estimated from the data. Such models are called linear models. Most commonly, the conditional mean of the response given the values of the explanatory variables (or predictors) is assumed to be an affine function of those values; less commonly, the conditional median or some other quantile is used.

B. Bar plot

A bar chart or bar graph is a chart or graph that presents categorical data with rectangular bars with heights or lengths proportional to the values that they represent. The bars can be plotted vertically or horizontally.

C. Seaborn library

Seaborn is a Python data visualization library based on matplotlib. It provides a high-level interface for drawing attractive and informative statistical graphics. For a brief introduction to the ideas behind the library, you can read the introductory notes.

IV.FLOW CHART

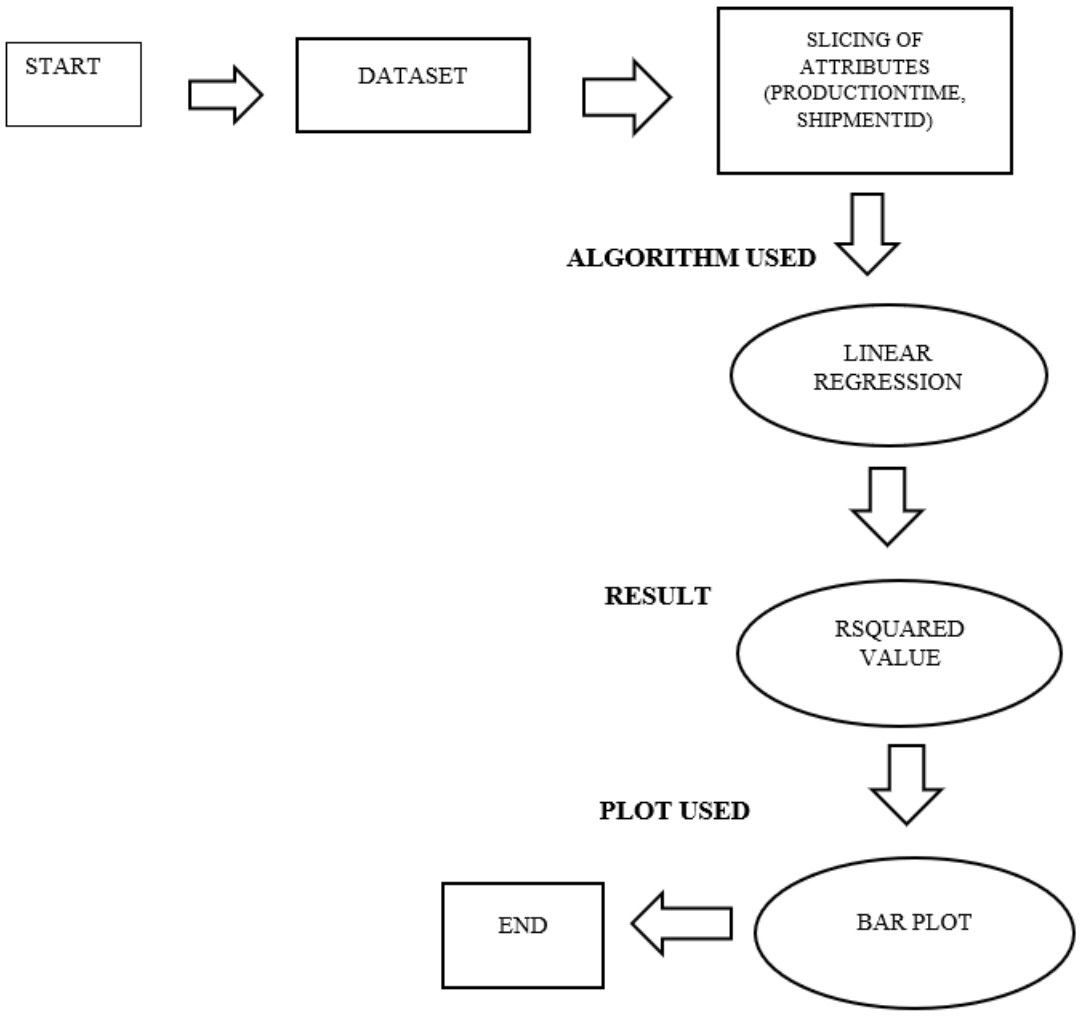

FIG 1.1

V.RESULT AND DISCUSSION

```
In [23]: from sklearn.preprocessing import PolynomialFeatures
         from sklearn.pipeline import make_pipeline

In [24]: model = make_pipeline(PolynomialFeatures(3),reg)

In [28]: model.fit(data,dataset.SHIPMENTID)

Out[28]: Pipeline(steps=[('polynomialfeatures', PolynomialFeatures(degree=3)),
                         ('linearregression', LinearRegression())])

In [26]: pred = model.predict(data)

In [27]: from sklearn.metrics import r2_score

In [29]: r2_score(pred,dataset.SHIPMENTID)

Out[29]: -0.28813261155165915
```

Fig 1.2

In the Fig 1.2 R^2 of 1 indicates that the regression predictions perfectly fit the data. R2 values of 0.75, 0.50, or 0.25 can, as a rough rule of thumb, be respectively described as substantial, moderate, or weak. R-Squared value of 0.9 would indicate that 90% of the variance of the dependent variable being studied is explained by the variance of the independent. Therefore, PRODUCTQTY AND SHIPMENTID are concluded as independant variable.

BAR PLOT

```
In [31]: sns.barplot(dataset.SHIPMENTID,dataset.PRODUCTQTY)

C:\Users\Ashok Kumar\anaconda3\lib\site-packages\seaborn\_decorators.py:36: FutureWarning: Pass the following variables as keyw
ord args: x, y. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an ex
plicit keyword will result in an error or misinterpretation.
  warnings.warn(

Out[31]: <AxesSubplot:xlabel='SHIPMENTID', ylabel='PRODUCTQTY'>
```

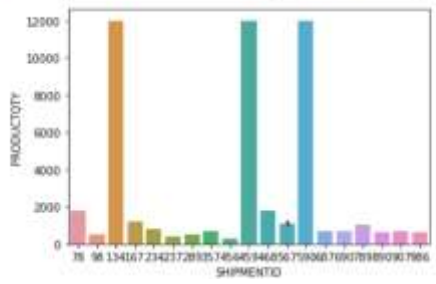

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Fig 1.3

KDE PLOT

```
Out[32]: <AxesSubplot:xlabel='SHIPMENTID', ylabel='PRODUCTQTY'>
```

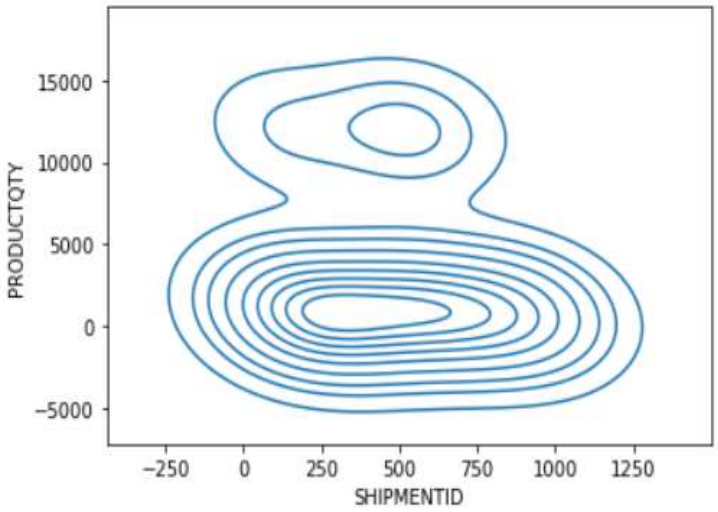

Fig 1.4

The above figures shows the relationship of the variables. We can clearly understand that both are independent variables with the regression line with bar plot and kde plot.

FINDINGS

- This analysis is made on shipment tracking process.
- Using linear regression we predicted the r squared score -0.288
- Visualised using bar plot and kde plot it shows where the shipment gets delay.

VI. CONCLUSION

In this paper, the analysis made on shipment tracking process in supply chain visibility. Linear regression is used to analyse the dependent and independent variable of the attributes and to find the accuracy score of the attributes. Predicted the accuracy score of the attributes using linear regression. R-Squared value of 0.9 would indicate that 90% of the variance of the dependent variable being studied is explained by the variance of the independent.

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