

A STUDY ON MANPOWER REQUIREMENTS IN PRODUCTION USING PREDICTIVE ANALYSIS

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ABSTRACT

The Supply chain management is the management of the flow of goods and services and includes all processes that transform raw materials into final products. Predictive analytics is that the use of knowledge, statistical algorithms and machine learning techniques to spot the likelihood of future outcomes supported historical data. The main objective of this paper is man power planning which involves reviewing current manpower resources, forecasting future requirements and availability, and taking steps to ensure that the supply of people and skills meets demand.

KEY WORDS: Predictive analysis, Linear regression.

I. INTRODUCTION

Predictive analysis is that the use of given data, algorithms and machine learning techniques to spot future outcomes supported historical data. It is to help solve difficult problems and new opportunities. It is used in various sectors like marketing, sports, healthcare, child protection, mobility, capacity planning, social networking and many other fields. Predictive analytics models capture relationships among many factors to assess risk with a particular set of conditions to assign a score, or weightage. By successfully applying predictive analytics the businesses can effectively interpret big data for their benefit. It allows organizations to become looking forward and behaviors based upon the given data. It is the branch of analysis which used to make predictive analysis many techniques. from data mining, statistics, modeling, machine learning, and artificial intelligence to analyze current data to make predictions about future. It uses a number of data mining, predictive modeling and analytical techniques to bring together the management, information technology, and modeling business process to make predictions about future. The patterns found in historical and transactional data can be used to identify risks and opportunities for future.

The process of predictive analytics process are:

1. Define project: Define the project outcomes, organization objectives, and to identify the data sets which are going to be used in the process.
2. Data collection: It collects data from different sources for analysis. And provide the complete view of customer interactions.
3. Data analysis: It is the process of gathering, inspecting, cleaning, and modeling the data with objective of discovering the right information.
4. Statistics: It enables to validate assumptions and test use them with standard models.

5. Modeling: It provides the ability to create accurate prediction about future. And option to choose the best solution with multi model.
6. Development: It provides the option to deploy the analytical results to the decision making process to get the outcome based on modeling.

II. RELATED WORKS

Nowadays, businesses adopt ever-increasing precision marketing efforts to remain competitive and to maintain or grow their margin of profit. As such, forecasting models have been widely applied in precision marketing to understand and fulfill customer needs and expectations.[1]

Supply chain management (SCM) focuses on flow of goods, services, and information from points of origin to customers through a chain of entities and activities that are connected to one another.[2]

However, this is not the case in reality, as there are uncertainties arising from variations in customers' demand, supplies transportation, organizational risks and lead times. Demand uncertainties, in particular, has the greatest influence on SC performance with widespread effects on production scheduling, inventory planning, and transportation.[3]

With the advancements in information technologies and improved computational efficiencies, big data analytics (BDA) has emerged as a means of arriving at more precise predictions that better reflect customer needs, facilitate assessment of SC performance, improve the efficiency of SC, reduce reaction time, and support SC risk assessment.[4]

These bakery goods are ordered and clustered daily with a continuous need to demand forecasts in order to avoid both shortage or waste .Fuel demand forecasting in thermal power plants is another domain with applications of clustering methods. Electricity consumption patterns are derived using a clustering of consumers, and on that basis, demand for the required fuel is established.[5]

III. METHODOLOGY

LINEAR REGRESSION

Linear regression is the machine learning with supervised learning. It replicates the regression task. Regression models are based on independent variables. It is used to find the difference between variables and forecasting. It compares the two attributes and fetch the required result. For more than one regression the process is called multiple linear regression. It is the first type of regression analysis is to be studied and to be used in practical application. It has many practical uses and they fall into two major categories. The KDE plot is described as Kernel Density Estimate it **want to** show the probability density of **endless** variable. It can improve its prediction accuracy. It can also plot single graph for multiple samples which helps in data visualization. A Bar chart is also known as bar graph which represents categorical data with rectangular bars with heights or length. It plotted vertically or horizontally. It provides visual presentation of categorical data.

IV. RESULT

ALGORITHM

LINEAR REGRESSION

KDE GRAPH

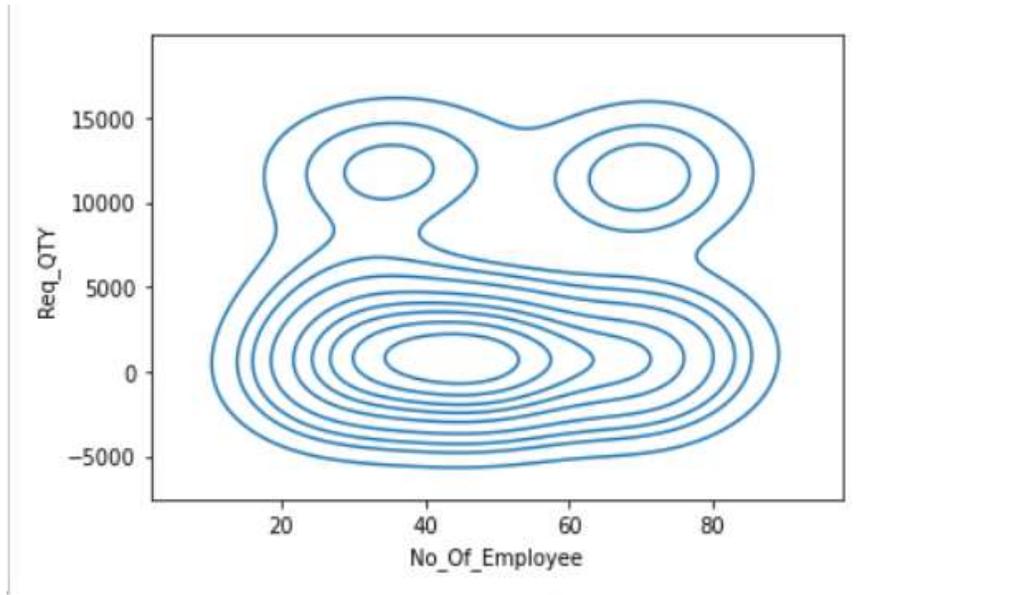
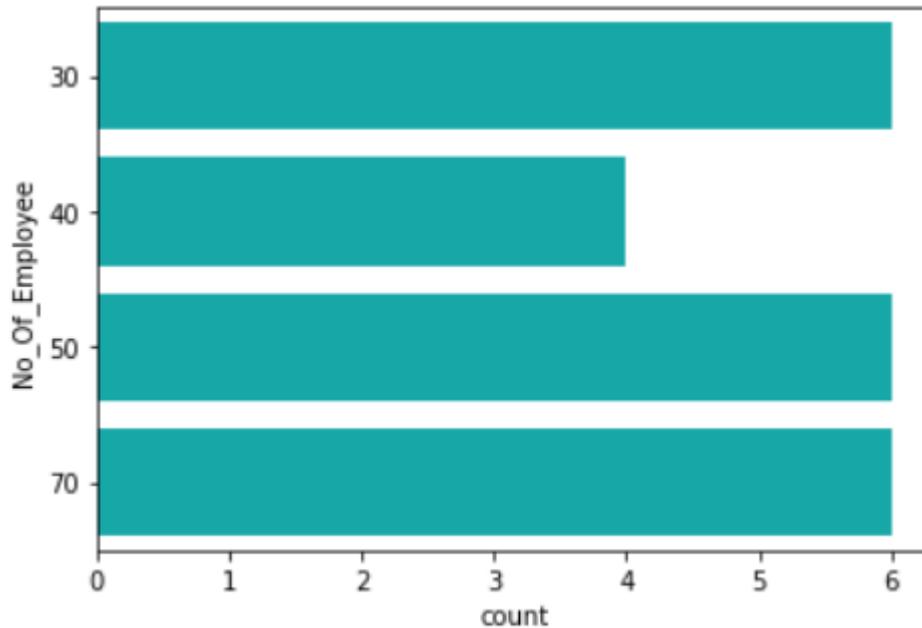


Fig:4.1

The above KDE graph represent the required quantities and the no of employee required. This graph represents as the required quantity increases number of required employees is also increase.

BAR GRAPH**Fig:4.2**

The above bar graph represent the required quantities and the no of employee required. This graph shows as the required quantity is four (4) the required employees is forty (40). This represents as the required quantity increases the number of required employees is also increase.

FINDINGS:

- The prediction is made by using the bar chart and KDE plot in linear regression the range have been predicted.
- When the number of quantity increases simultaneously the number of required employees is also increasing in the accurate manner.
- That is when the required quantity is four(4) the required employees is forty(40) and the required quantity is six(6) the required employees is seventy(70)

V. CONCLUSION

This paper is to find the increase or decrease in the supply chains of Man power required in production. When quantity increases the number of employees required is also increases this was found by comparing the attributes required quantity and number of employees required using linear regression algorithm with using KDE graph and BAR chart.

FURTHER WORK:

It is suggested that as the number of employees increases when the required quantity increases. So when the required employees increases, they can take over the employees from other departments. So that it can reduce the time and cost rather than allotting new employees.

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