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Employee Attrition Prediction using Machine Learning

Purva Jadhav, Veena Badgujar, Aneeksha Jain, Jyoti Bansode

Information Technology Shah & Anchor Kutchhi Engineering College Mumbai,India
Assistant Professor Shah & Anchor Kutchhi Engineering College Mumbai,India
Information Technology Shah & Anchor Kutchhi Engineering College Mumbai,India
Assistant Professor Shah & Anchor Kutchhi Engineering College Mumbai,India

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ABSTRACT— There have been many advancements in the technological department in recent years. Everyone has to adapt with the changes occurring in technological fields. They have to get comfortable with the daily changing environment. Organizations have to ensure that growth is fundamental in this world. There are several reasons due to which the employees in an organization are to be lessened. Each and every organization has to make their future secure. They should maintain discipline in the organization. The proposed system should be able to correctly predict the reasons for employee attrition.

Keywords— attrition,organization,employees

I. INTRODUCTION

The world is in a constant phase of changing and it expects each one of us to get comfortable with the new version of it. One should be aware of the advancements taking place in the world and should be ready for the change. As we update our mobile phones or laptops regularly we should also update ourselves. Every organization works towards the growth and development of itself. In the process it has to consider several factors which can prove to be the asset for that organization. Also it should understand the factors responsible for degrading the performance of the organization. One such method to ensure that the organization is functioning properly is employee attrition. Employee attrition seems to be an inevitable part of any organization. In order to run an organization one needs to perform attrition. It costs heavily to an organization and performing such attritions is the responsibility of the human resources department of any organization. Sometimes there arises a situation when an employee has to quit due to personal reasons. It poses a major threat to an organization if the attrition rate is higher. There are several types of attrition namely voluntarily, due to retirement, involuntary, internal, demographic and external. Employee attrition has been a focus of research for the last few decades. The primary idea is to minimize the people in an organization before previous replacement.Employee attrition has a greater impact on all the businesses in the society. It leads to an increase in the cost of the company. One should understand the key factors involve in the attrition process and try to find out a solution. Many factors such as age,salary,number of days spent in the company affect the attrition rate. The employees in any organization are valuable assets. An employee may leave the organization due to lack of promotion or other factors. New hiring will affect the organization in financial terms and would be unprofitable.

II. PROBLEM STATEMENT

Employee attrition can cause a major threat to an organization and its functioning. The HR department has to work hard on solving such problems in any organization. It is their responsibility to the organization to manage the attrition rate and find out the reasons for the same. The proposed system will take several inputs from the organization and will accordingly predict the attrition count of the organization.

III. OBJECTIVES

- To determine the rate of attrition of employees in any organization
- To understand the reasons for attrition and try to find a solution for the same
- To compare and use different algorithms for determining attrition rate of employees
- To develop a solution for exactly calculating the attrition rate

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IV. IMPLEMENTATION AND RESULTS

After Here the dataset was used to predict attrition rate of employees. The original dataset consisted of 14520 rows and 13 columns. First the dataset was studied and was analyzed in detail.

Mapping non-numeric to numeric values

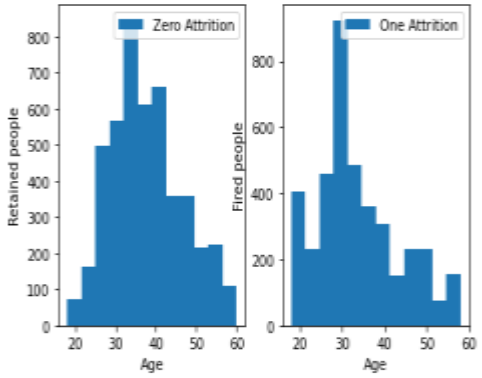
Here there were many values in the system or dataset which were non-numeric. So it was difficult to process data with the non-numeric values. The non-numeric values were converted into numeric values for smooth processing of data.

```
[ ] df.BusinessTravel.replace('Non-Travel', '0', inplace = True)
    df.BusinessTravel.replace('Travel_Rarely', '1', inplace = True)
    df.BusinessTravel.replace('Travel_Frequently', '2', inplace = True)
    df.BusinessTravel.astype('int64')
```

```
0       0
1       1
2       1
3       1
4       1
       ..
8695    1
8696    1
8697    2
8698    2
8699    2
Name: BusinessTravel, Length: 8700, dtype: int64
```

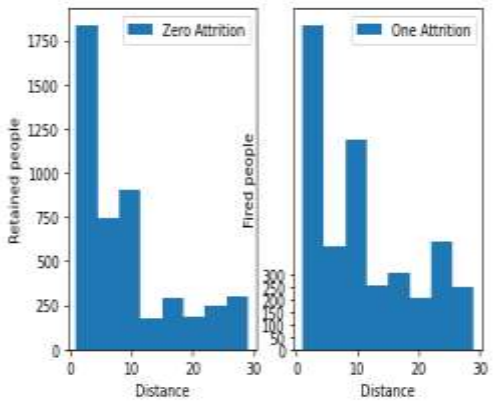
Graph for the attrition rate on the basis of age

```
plt.show()
```



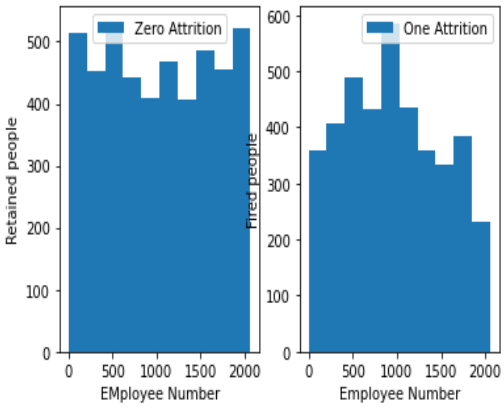
Graph on the basis of distance

```
plt.show()
```



Graph on the basis of number of employees

```
plt.show()
```



Logistic regression model

```
[ ] model_1_accuracy = accuracy_score(testy,y11)
    model_1_accuracy
```

```
0.7967816091954023
```

```
[ ] model_1_precision = precision_score(testy,y11)
    model_1_precision
```

```
0.7988902691511387
```

```
[ ] model_1_recall = recall_score(testy,y11)
    model_1_recall
```

```
0.7689561752988048
```

Web application preview

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V. CONCLUSION

From the above proposed system,organizations will be able to correctly predict the rate of attrition on the basis of a number of factors. The dataset was preprocessed and various conversions were performed. Models were deployed and the evaluation parameters were calculated. The accuracy and other evaluation parameters of the logistic regression model were used in the web application.

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