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A Survey on Employee Churn Prediction Using Machine Learning

Prof.Madhusudhan G K[1], Dheeraj G[2], Madappa S[3], Manasa T N [4] , Meghana B R[5]

Assistance Professor, Department of Computer Science and Engineering, Vidya Vikas Institute of Engineering and Technology, Mysuru, India[1]

Students, Department of Computer Science and Engineering, Vidya Vikas Institute of Engineering and Technology, Mysuru, India [2,3,4,5]

ABSTRACT: Employee churn prediction which is closely related to customer churn prediction is a major issue of the companies. In this project, we are applying well-known classification methods including, Decision Tree, Logistic Regression, SVM, KNN, Random Forest, and Naïve Bayes methods on the datasets. Then, we analyse the results by calculating the accuracy and precision of the results. Moreover, we implement a feature selection method on the data and analyze the results with previous ones. The results will lead companies to predict their employees churn status and consequently help them to reduce their human resource costs.

KEYWORDS: Employee churnPrediction, Machine learning algorithms, classification, data analysis .

I. INTRODUCTION

Employee churn is a major problem and one of the most important concerns for large companies. Due to the direct effect on the revenues of the companies, especially in the IT field. Therefore, finding factors that increase employee to leave or to retain is important to take necessary actions to reduce this churn. The main contribution of our work is to develop a churn prediction model which assists companies to predict employees who are most likely to churn or to retain.

From global level industry giants to small level companies, employee churn can have deleterious effect. Financial resource required to find and hire appropriate employeesisnontrivial.Investinginhiringprocessjusttofindoutemployee'schurn can be despairing. Consolidating Employee Churn Prediction Model in the hiring process aids in hiring process, thereby reducing the risk of financial losses resulting from employeeattrition. For any organization, finding a well trained and experienced worker may be a complicated task, however it's even additional complicated to interchange such workers. This not solely will increasethemanyHumanResource(HR)price,howeveradditionallyimpactsthemarketprice of a corporation. Therefore, the aim of this project is to supply a framework for predicting the worker churn by analysing the employee's precise behaviors and attributes mistreatment classification techniques.

In this study we are implementing the things using well known techniques of data classification like Decision Tree, Logistic Regression, SVM, KNN, Random Forest, and Naïve Bayes methods on the datasets. Here we are using the data set that is provided by IBM which as 1470 records with all most 20 plus features that includes both numerical and categorical and also some cleaning of data also done. Here we are using the machine learning algorithms, where Ml there are test and train data to check the accurate results.

II. RELATED WORK

In study, some factors like promotion, salary, job Satisfaction, working environment also turnover affect the employee churn. There are other attributes like gender, age, education /qualification and marital status, which play an important role in predicting overall churn of any employee. For certain condition emplo yees having excellent performance is really tough to find their replacement. Thus, production efficiency and current projects can get disturbed by such factors. Finding right one and replacing them is time consuming and also it's costly. And even after finding the right replacement it is hard to achieve same goals and also good performance.Adapting person with same set of skill for respective job is hard for industries, which can affect their existing works. Organizations to overcome all these sort of challenges, so various organizations apply machine learning models to solve and predict employee's their future

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activities. Before, Head recruiter managed and calculated earlier rate and attempt to forecast the employee with high chances of leaving organization manually. They are not that effective in some of the situation as machine learning models.

Both customer and employee churn have different aspects. This helps in retaining employee and refining employee management tactics. Hence machine learning is beneficial in improving and developing agile prediction system. Some facts that are useful to understand the employee churn and customer churn in a simple way:

- In market it's hard to select right customers but the Companies will select their employees according to requirement.
- Company or organization is made up of employees and they help company to grow and sustain in their reputation as well.
- If employee leaves suddenly it disturbs organization performance, projects, consumes money and time in training new candidate. Similarly, when a customer is lost then it affects income and hard to gain new customers.

Considering that employee churn is closely related with customer churn but not identical, and also the costs related to employee churn, which are even higher than customer churns in some companies, the literature needs further attention of researchers in this field.

The accuracy of the employee churn prediction is dependent on the method used and also data considered. Therefore, the present aim of the study is to maximize the accuracy of the prediction model. Employee attrition is a binary classification problem that uses classification techniques of machine learning like SVM, decision tree (DT), logistic regression and neural network etc. For simplicity and interpretability of model, researcher and academicians will use DT and logistic regression and along with this for the predictive power and for better accuracy, even more advance models and techniques are used. For example the author uses K-nearest neighbor, DT and artificial neural network in the field of prediction of churn but the results are recommend to use neural network for better performance .

II. METHODOLOGY

1. Analyzing the employee churn data set that consists of current and past employee's records.
2. Cleaning the data set, handling the missing information and derive new features if required.
3. Selecting the features among the employee data that are suitable for the prediction of churn.
4. Trying several classification algorithms and comparing the accuracy and precision on the test data.
5. Applying feature selection method, and select the features that are more convenient in order to predict employee churn.
6. Building classification model for prediction.

III. CONCLUSION

The proposed system will be an employee churn rate prediction system that identifies the possibility of the employee quitting the job. As it is one of the important issues in IT sector, a trained and experienced employee is hard to replace. Hence, this model helps the companies/organizations to know the reasons why employees leave/switch companies so they can take appropriate preventive measures and to enhance company's performance and decrease overall revenue spent on recruitment and training. As a future direction we plan to build a comprehensive model that the organization can use for the better of the employees, cost effectiveness and future prospects.

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