**ReviewAnd Analysis Of Employee Attrition And Performance**

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**ABSTRACT:-** One of the major issues facing business leaders within companies is the loss of talented employees. . As employee is the main functioning body of an organization.The rate of growth of an organization or success and failure is depend on the employees and there performances.When a well trained employee decided to leave the organization without providing any previous information to organization then it affect the growth of organization This studies employee attrition using machine learning models.

The purpose of model is to analyzing the dataset of employees of an organization taken from internet and to finding the probability of employee leaving or resignation from the job..Firstly, we collect dataset of employees from organization then we divide the dataset into two parts – trining and testing. Secondly, we apply various algorithm like Random forest classification,etc. on the testing part after using on training part then we choose the best algorithm by comparing there accuracy score which help the organization to handle situation and prepare for recruitment process or knowing the factor which affect the employee to make feel to leave the job.

1. **INTRODUCTION**

Employee attrition can be defined as the loss of employees due to any of the following reasons: personal reasons, low job satisfaction, low salary, and a bad business environment. Employee attrition can be categorised into two categories: voluntary and involuntary attrition. Involuntary attrition occurs when employees are terminated by their employer for different reasons, such as low employee performance or business requirements. In voluntary attrition, on the other hand, high-performing employees decide to leave the company of their own.

When a well performanced employee leave the organization without any initial informed to the manager then the manager of that organization faced difficuties. If the manager of organization have any prevoius information about the employee attrition then he/she start hiring new employee process and focussed on what the parameter which influenced the employee’s mentality and performance. Recently, Infosys,Wipro,TCS and other indian IT gaints facing high attrition record. Record-high attrition rates are adding to the woes of the Indian IT industry as companies face cost overloads and margin pressures. Tata Consultancy Services (TCS), Infosys, and Wipro - the top three IT behemoths in India - raised their net hirings to over 50,000 in the first quarter of the financial year 2022-23 as a result of high attrition, as per their financial results.

Attrition rate refers to the metric used to measure the loss of employees over time. Infosys’ attrition rate stood at 28.4 per cent, the highest among Indian IT bellwethers, in the first quarter of the financial year 2022-23. Wipro came in next with an attrition rate of 23.3 per cent while the attrition rate at Tech Mahindra was reported at 22 per cent. CP Gurnani, Managing Director and Chief Executive Officer of Tech Mahindra, reasoned that the high attrition rates could be attributed to the rapid expansions in the industry. He said, “In general when an industry goes through a rapid surge, there is shock with attrition rate running at 23-24%, I think that shock stage is now coming down.” TCS’ attrition rate spiked to 19.7 per cent, a rise of 2.3 per cent from the previous quarter, albeit lesser than its peers. Rajesh Gopinathan, CEO of the largest Indian IT company TCS, pointed out after the quarterly results announcement that the firm’s attrition rate has not come down yet, but might do so in the coming quarters. He said, “On an absolute basis it (attrition rate) is continuing to increase though on a percentage basis it is starting to flatten and that may continue into part of Q2 also.”

An IT sector employee based in Bengaluru told Business Today why he thinks Indian techies change jobs so often. He said, “The growth opportunities are very less if we stay in the same company for more than 1-2 years now. The growth trajectory at any of the top Indian IT companies is not the same like it used to be before, we have cutthroat competition in the industry. ”

To avoid the situation of facing rapid recruitment process, we prepare a model which helping the manager of organization to knowing what and who will be leaving his/her organization so the manager prepare for the situation and takedecision according to the stage.In this model, we take data from organization from internet which include parameters like Age of the employee, Business travel, department, Distance from home, Education, Education Field, Employee Count ,Employee Number, Environment, Satisfaction gender, Job involvement, job level, Job role, Job satisfaction, Marital status, Monthly income, Number companies worked, Over18 , Percent salary hike, Performance Rating, Relationship Satisfaction, Standard hours, Stock option level, Total working years, Training times last year, Work life balance, Years at company, Years since last promotion, years with current manager. After getting data we execute various algorithms like Decision tree, Logistic regression, Naïve Bayesian algorithm, Random forest classification, Gaussian Naïve Bayes classier, k-means clustering to analyze the dataset and predicate the probability of employee’s attrition rate by taking the most accuracy score giving by algorithm.

1. **RELATED PREVIOUS WORK**

One of the branches of analytics is HR analytics, which is developing the system HR units in organizations function, principal to sophisticated proficiency, and improved outcomes overall. The usage of analytics by human resources for many years. Though the assortment, processing, and data analysis have been generally manual and specified the nature of HR dynamics, the approach has been constraining HR. The prospect to effort predictive analytics in categorizing the employees furthermost likely to grow promoted. Here we apply machine learning techniques to analyze the employee information for improving his/her position in the organization. Compensation and job performance information from revenue rates and personnel characteristics to payroll and service history, never before have HR executives had such liberated right to use to individual details. In this work, we are applying random forest classification, which facilitates employee classification based on their monthly income and informal way to execute analytics on data. Further, we use clustering techniques based on the performance metrics similarity to analyze employee performance.

In this paper [1] employee attrition is the loss of employees in a company caused by several factors, namely employees resigning, retiring, or other factors. This research aims to help the human resources department in the company to find out what factors influence the occurrence of employee attrition, by developing a new method of predicting attrition that this study aims to detect employee attrition in a company by implementing the Random Forest classification modeling. From the results of the tests that have been carried out, Information Gain produces the highest accuracy value of 89.2%, while Select K Best produces an accuracy value of 87.8% and Recursive Feature Elimination produces an accuracy value of 88.8%

In paper [2] to find the probability of new employee attrition, various classification algorithms such as decision trees (DT) classifier, logistic regression (LR), random forests (RF), and K-means clustering are used. The accuracy provided by the decision tree is 97% the accuracy provided by random forest algorithm is 98% the accuracy provided by the logistic regression is 78%. This research aims to identify the most critical elements that contribute to employee attrition. Used ML algorithms for binomial classification problem are: decision trees, logistic regression, and random forest

The aim of paper [3] is to improving performance of algorithms. The usage of NB algorithm, KNN algorithm and SVM algorithm, prediction mannequin has been in contrast on the experimental groundwork and supply the end result of which algorithm is performing better. Naive Bayesian algorithms, K-nearest neighbors, and support vector machine data science techniques were applied to the predictions. Naive Bayes Algorithm predicted the developer turnover with the accuracy of 76%, K-Nearest Neighbor with the accuracy of 94% and Support Vector Machine with the accuracy of 96%

In this paper [4] there is using of various algorithms which are Gaussian Naïve Bayes Classifier, Decision Tree, Logistic Regression and Model tested on IBM analysis dataset best recall rate (0.54).It helps in HR activities optimizes and reduce critical issues by analyzing of data. The Techniques used for better error estimation are Holdout, Cross validation Scaling is used to avoid that one features is dominating

In paper [5] we study the concept of employee retention on key variables. Training, types of training and duration and check the effect of training or retention of employee satisfaction leads to employee dissatisfaction leads to high turnover. The objective is to identify the effect of training, its types and duration on retention. Main reason for employee retention are Training time and its duration, Support Interest among employee, workplace environment, Reward.

In paper [6] we study that most of the organization or companies have a formal performance evaluation system in which employee job performance is graded on a regular basis, usually once or twice a year. An Employee can improve their performance by way of monitoring the progression of their performance by way of Machine learning algorithms i.e. clustering algorithm and decision tree of data mining techniques can be used to find out the key characteristics of future prediction of an organization.

In paper [7] we study that Machine learning (ML) is scientific study of algorithms and statistical models that computer system use to perform a specific task without being explicitly programmed. Learning algorithms in many application that’s we make use of daily. There are various type of Machine learning techniques that are supervised learning, unsupervised learning, semi-supervised learning, reinforcement learning, multi-task learning, ensemble learning, neural network, instance based learning.

**III.**  **PROPOSED METHODOLOGY AND MODEL**