HR HELPING HAND: THE EMPLOYEE ATTRITION AND PERFORMANCE ANALYSIS

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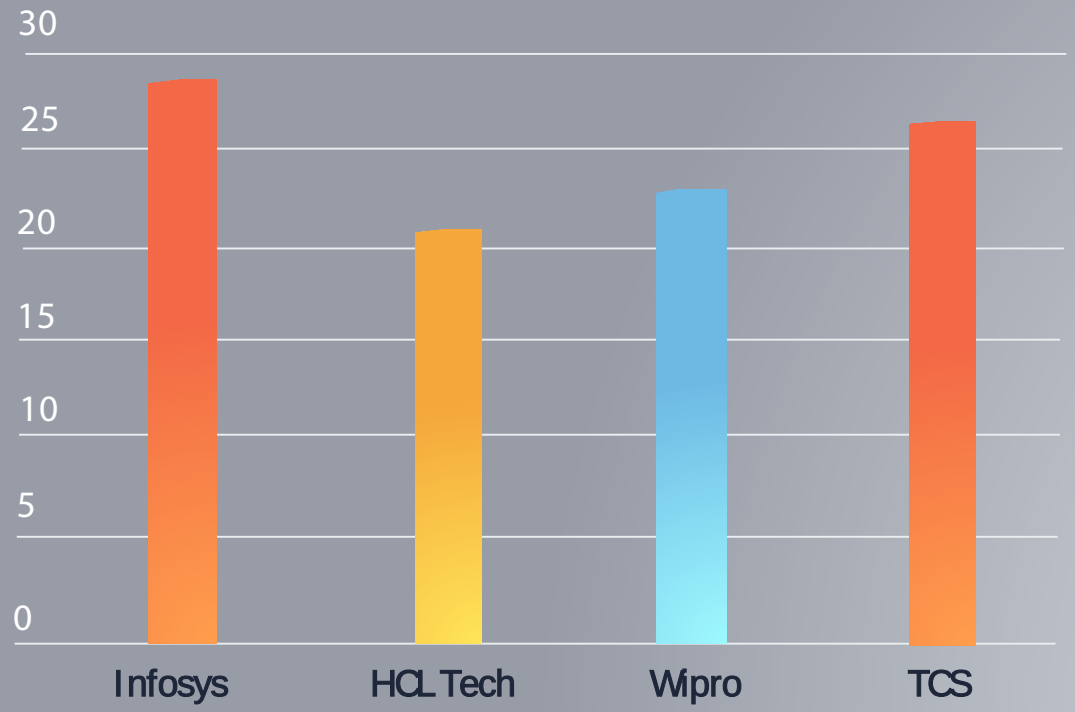
INTRODUCTION

HR estimates the requirement of human resources in each part of organization and plan to recruit talented people, placing each employee's progression, employee's retention, attrition, salaries and other welfare benefits. Employees are the treasured property of any organization. However, if you quit your job unexpectedly, the company will cost a lot of money. Not only new employees are wasting money and time, but new employees are also spending time making profits for their companies.

IT companies —Tata Consultancy Services (TCS), Infosys, Wipro and HCL Tech, among others —are facing high attrition rates and the IT sector's average attrition rate (last twelve months) is currently as high as 25 per cent.



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By Mohammad Haris

LITRATURE SURVEY

Paper[1] SindiFatika Sari, Kemas Muslim Lhaksmana. Employee Attrition Predition Using Feature Selection with information Gain and Random Forest Classification.
This research aims to help the human resources department in the company to find out what factors influence the 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%

Paper[2] Elham Mohammed Thabit A. Alsaadi; SameerahFarisKhlebus, AshwakAlabaichi. Idenification of humanresourse analytics using machine learning algorithms.
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

Paper[3] Vinston Raja R; Srinath Doss; Ashok Kumar K. Analytics Approach of predicting Employee Attrition using data science techniques.
The usage of NB algorithm, KNN algorithm and SVM algorithm, prediction 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%

Paper[4] EvanthiaFaliagka, Kostas Ramantas, Athanasios Tsakalidis Application of Machine Learning Algorithms to an online Recruitment System.
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

paper[5] Ali A. Mahmoud, Tahini AL Shawabkeh, Walid A. Salameh, Ibrahim Al Amro Performance predicting in hiring process and performance appraisals using machine learning.
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.

paper[6] AnanyaSarker, S.M. Shamim, Dr. Md. Shahiduz Zama & Md. Mustafizur Rahman Employee's Performance Analysis and prediction using K-means Clustering & Decision Tree Algorithm.
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.

OBJECTIVE OF OUR PROJECT

- **HR Analysis tool** for companies especially those with large workforce.
- To find the possible reasons for employee attrition, in order to prevent valuable employees from leaving.
- Predicting employee’s performance rating.

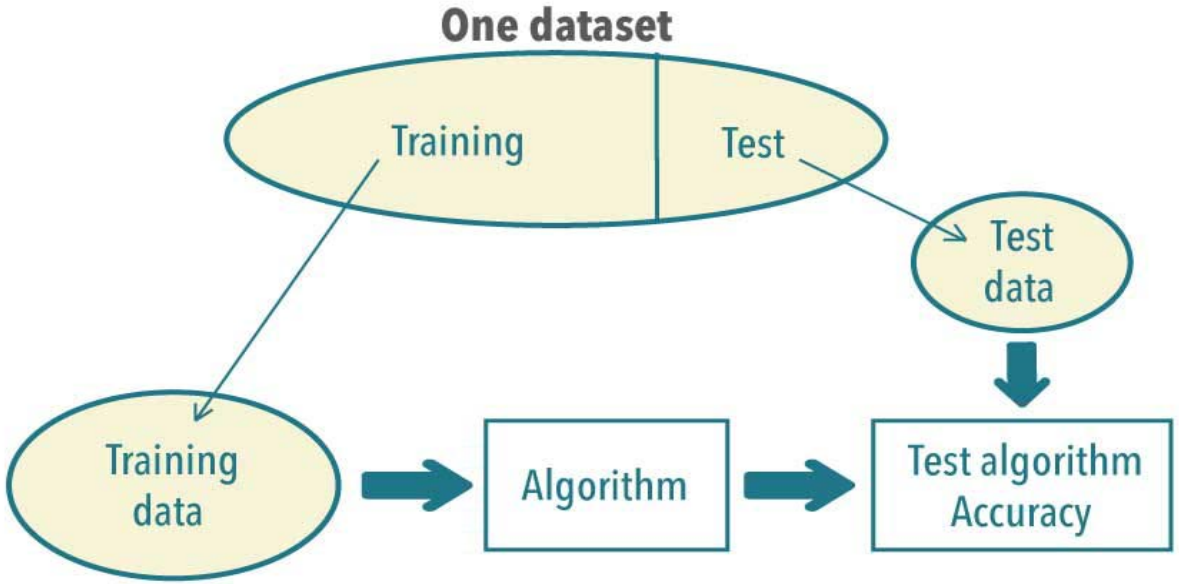
DATASET AND PARAMETERS

Variable	Meaning	Levels
Age	Age of the employee	
Attrition	Whether the employee left in the previous year or not	
BusinessTravel	How frequently the employees travelled for business purposes in the last year	
Department	Department in company	
DistanceFromHome	Distance from home in Kms	
Education	Education Level	1 'Below College'
		2 'College'
		3 'Bachelor'
		4 'Master'
		5 'Doctor'
EducationField	Field of education	
EmployeeCount	Employee count	
EmployeeNumber	Employee number/id	
EnvironmentSatisfaction	Work Environment Satisfaction Level	1 'Low'
		2 'Medium'
		3 'High'
		4 'Very High'

Gender	Gender of employee	
Job Involvement	Job Involvement Level	1 'Low'
		2 'Medium'
		3 'High'
		4 'Very High'
JobLevel	Job level at company on a scale of 1 to 5	
JobRole	Name of job role in company	
JobSatisfaction	Job Satisfaction Level	1 'Low'
		2 'Medium'
		3 'High'
		4 'Very High'
MaritalStatus	Marital status of the employee	
MonthlyIncome	Monthly income in rupees per month	
NumCompaniesWorked	Total number of companies the employee has worked for	
Over18	Whether the employee is above 18 years of age or not	
PercentSalaryHike	Percent salary hike for last year	
PerformanceRating	Performance rating for last year	1 'Low'
		2 'Good'
		3 'Excellent'
		4 'Outstanding'
RelationshipSatisfaction	Relationship satisfaction level	1 'Low'
		2 'Medium'
		3 'High'
		4 'Very High'

Standard Hours	Standard hours of work for the employee	
Stock Option Level	Stock option level of the employee	
Total Working Years	Total number of years the employee has worked so far	
TrainingTimesLastYear	Number of times training was conducted for this employee last year	
WorkLifeBalance	Work life balance level	1 'Bad' 2 'Good' 3 'Better' 4 'Best'
YearsAtCompany	Total number of years spent at the company by the employee	
YearsSinceLastPromotion	Number of years since last promotion	
YearsWithCurrManager	Number of years under current manager	

Training data vs. test data



PROPOSED MODEL

Data Cleaning
and
Data Custering

Features used for Attrition

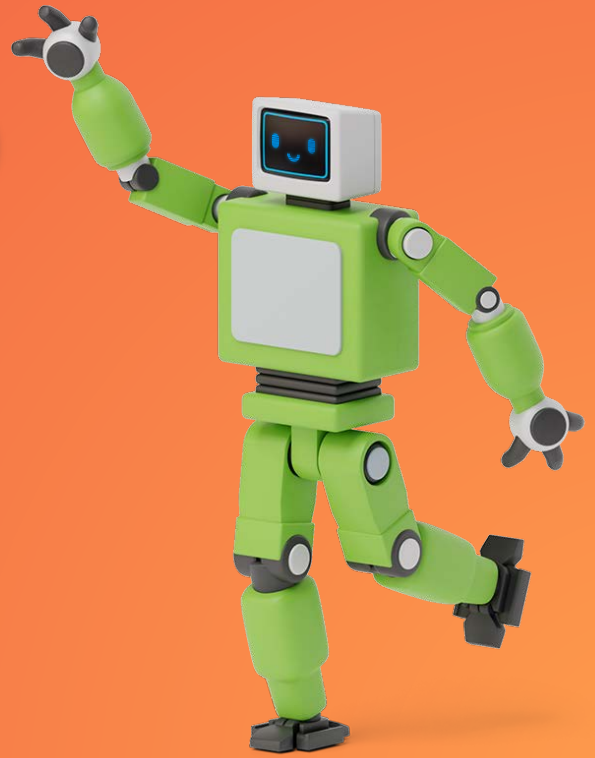
Features used for Performance analysis

Apply various Machine Learning Algorithm

Predict attrition of employee

Analyze the performance of employee

Calulate the accuracy score



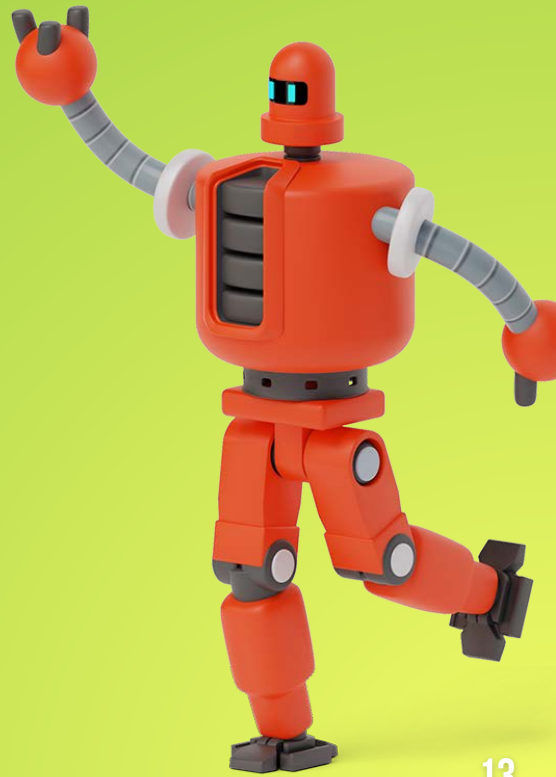
AlGORITHM TO BE USED

For Attrition Prediction

- Decision Tree
- Random Forest
- Logistic Regression
- SVM

For Performance Analysis

- K-mean clustering
- hierarchical Clustering



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[5].Ali A. Mahmoud, Tahini AL Shawabkeh, Walid A. Salameh, Ibrahim Al Amro Performance predicting in hiring process and performance appraisals using machine learning.

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TEAM PRESENTATION

Rohit Sharma
CSE-Department

Nishant Kumar
CSE-Department

Mohd. Shahjahan
CSE-Department

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