



## Accessing the Organisation by Predicting Employee Attrition Rate

Ashwini Kumari<sup>1</sup>, S.S.Savkare<sup>2</sup>, Rucha Londhe<sup>3</sup>, Sahil Admane<sup>4</sup>, A.S.Deokate<sup>5</sup>

*Department of Electronics and Telecommunications Engineering, SKNCOE, SPPU, Pune*

<sup>1</sup>Ashwinikumari0881@gmail.com

<sup>2</sup>Swati\_savkare@yahoo.com

<sup>3</sup>Ruchalondhe69@gmail.com

<sup>4</sup>Sahiladmane19998@gmail.com

<sup>5</sup>d.archana455@gmail.com

**Abstract**— Employees are valuable assets of any organization. But if they quit jobs unexpectedly, it may incur a huge cost to any organization. Employee attrition is a reduction in manpower in any organization where employees may voluntarily leave the organization, so designing a model that helps to predict attrition rate and understand the key variables that influence the employee attrition rate using machine learning. Organizations face huge cost resulting from employee turnover. It may incur a high cost such as training expenses and the time it takes from when an employee starts to when they become a productive member. When a productive employee quits the organization, it will loss new ideas, great project management. To overcome this, a system is design for finding the hidden reasons for employees' attrition can be identified, and management can take preventive actions regarding attrition of each employee. To implement the proposed model, The data is downloaded from Kaggle is preprocessed to extract the features that are quite natural for employee attrition, and becomes as input to the model. The main attributes are total working years, salary hike, satisfaction level. Using dependent variable, we reached to the factors that are mostly dependent on employee related variables. So here by using the dataset the model achieves the terms or the factor that are mostly affect the employee attrition rate. The analyzed data is visualized for word to vector formation and on this fined tuned data we can apply algorithm to get the final result. Using Random Forest algorithm, the proposed system is performing well in predicting the employee, those are likely to quit the respective organization based on their working details.

**Keywords** - Attrition Rate, Classifier, Random Forest algorithm, Organisation, Employee

### I INTRODUCTION

The outcome of many research suggests that the most valuable asset and necessary resources in businesses are their employees. Now a days due to increase competition and multiplied requirement in employees skillability determines the attrition rate. The employee's attrition is viewed to be a serious problem for organisations. The amount of looking out and education personnel is very high. Firm want to search, hire and train fresher employees. Lock of experienced personnel mainly excessive performers is tough to control and is negatively related to the success and performance of organisations. The study focuses on the variables that may also lead to control the attrition of employee. Employee are valuable belongings of any organisation. But they stop unexpectedly, it can also incur massive amount of loss to an organisation. Employee attrition is a deduction in manpower in any firm where employees may additionally voluntarily depart the corporation or maybe retired. Employee turnover is the quantity of contemporary working personnel or reposition through new employees for a specific time period. It motivates big expenditure on human resource, by contributing toward new recruitment, training and development of the freshly appointed employee, also the performance management. Again, attrition which is of voluntary is unavoidable. hence, by way of improving worker morale and presenting a proper working environment, we can certainly minimize this hassle extensively the charge of attrition is described as the recruitment and termination standards of the company. An employee can leave the job for various reasons. Here, the Turnover and Attrition are the business terminologies that always conflict with each other. There are various kinds of turnover in an organization. Lowering the number of employees is mainly considered as the attrition. To analyse the manpower data and other measurements that are necessary for manpower planning these terminologies can be interchangeably used the problem of employee turnover has turn to eminence in organizations because of its pessimistic impacts on issues on work place self-esteem and efficiency. The organizations deal with this problem is by predicting the risk of attrition of employees using machine learning techniques thus giving organizations to take proactive action for retention.

## II

## LITERATURE SURVEY

A.Tambde,, D.Motwani focuses on prediction system to deal with problems associated with lack of knowledge of employee behaviour, to aware organisations about the importance of employee to prevent unnecessary employee churn and to improve growth of both separately. This system will enable the organisation to track their employee at condition without personally visiting them. Companies can take appropriate measure through predicted output and it can also act as an employee assessment system.[1]

A.M.Esmaieeli Sikaroudi, R.Ghousi, A.Esmaieeli Sikaroudi gives approach to employee turnover prediction on real data of a manufacturing plant ,KNN,SVM,MLP,PNN,CN2 are the algorithm used for the prediction. Naive bayes is the most user friendly model that has good performance in classification, here different data mining methods are compared based on their accuracy, calculation time and user friendless .In order to reach the desired user a graphical user interface is designed .[2]

R.Jayadi, H.M.Firmantyo, J.Dzaka, M.F.suaidy, A.M Putra presented employee performance prediction on company using Naives Bayes classification method .It can predict employee resignation before it happens and can decide in advance how to face it.[3]

A.A.Dudhe and S.R.Sakhare focuses on naïve bayes based on the probabilistic technique where classification is based on probability and decision tree is used to achieve accurate classification with minimum number of decision.[4]

R.Punnoose , Ajit, Pankaj presents extreme gradient boosting technique is used for predicting employee turnover. XG boost is more robust technique that demonstrate significantly higher accuracy.[5]

I. Omeralp yigit, H.Shourabizadeh approaches well known classification methods including decision tree,logistic regression. In this System predicts their employer's churn status and consequently reduce their human resource cost.[6]

A.Mhatre, A.Mahalingam, M Narayanan, A. Nair, S.Jaju presented the model using the risk segregated clusters given by the algorithm ,the HR team was able to retain the skilled employees thereby preventing loss of talent and experience.the overall attrition thereby reduced to around 30%.[7]

S.Yadav, A Jain, D.Singh provides a framework for predicting the employee churn by analysing the employee precise behaviour and attributes using classification techniques like logistic regression, support vector machine.[8]

S.K Monissa Tharani, S.K Vivek Raj focuses on employees intention to leave the organisation in the near future and indentifies the significant features impacting the employee intention to leave the organisation .XG boost algorithm is used for predicting employee turnover.[9]

## III

## PROBLEM STATEMENT

Organizations face huge costs resulting from employee turnover. It may incur a high cost such as training expenses and the time it takes from when an employee starts to when they become a productive member. When a productive employee quits the organization lost new product ideas, great project management, or customer relationships. This system helps to predict employee attrition and understand the key variables that influence the employee attrition rate using machine learning. Here we are using random forest algorithm to build a prediction model for identifying the various reason for employee turnover.

## IV

## PROPOSED SYSTEM

## 1. Data Uploading and feature understanding

The data downloaded from Kaggle is preprocessed first so that we can extract important features that are quit natural for employee attrition. This employee data is used as input to the system to find out why employees are leaving the company ,and learn to predict who will leave the company. The main features used for employee attrition are as follows:

- a. Monthly Income
- b. Last promotion year
- c. Current role in company
- d. Salary hike
- e. Total working years
- f. Satisfaction level
- g. Worked more compare to who stayed in the company.

## 2. Dependent variable analysis

Dependent variables or predicted variable are the one that helps to get the factors that mostly dependent on employee related variables. For example the employee ID or employee count has nothing to do with the attrition rate. So hereby using the dataset we achieve the terms or the factor that are mostly affect the employee attrition rate. The analysed data is visualized fir word to vector formation and on this fined tuned data we can apply algorithm to get the final result.

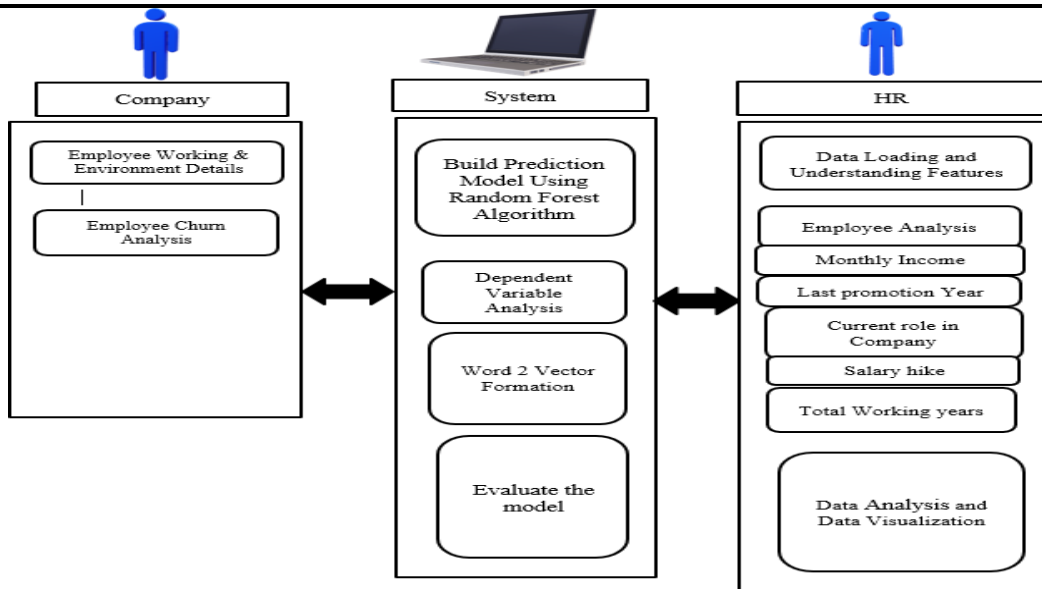


Fig1. Architecture diagram

### 3. Analytics

Exploratory data analysis is an initial process of analysis, in which you can summarize characteristics of data to predict who, and when an employee will terminate the service. Here we analyzed the critical features linked to attrition.

### 4. Built prediction Model

The system builds a prediction model by using the random forest technique. It is one of the ensemble learning techniques which consists of several decision trees rather than a single decision tree for classification. While classifying, all the trees in the random forest give a class to an unknown example, and the class having maximum votes will be assigned to the unknown example. These techniques perform dependent variable analysis and word formation vectors. To evaluate employee churn, hence, by improving employee assurance and providing a desirable working environment, we can certainly reduce this problem significantly.

## V RESULT AND DISCUSSION

The present work aims to predict employee attrition and understand the key variables that influence the employee attrition rate using machine learning. Firstly, we have designed an HTML document page for employees to register their username and password. So that users can get login.

### *Procedure 1: Registration page*

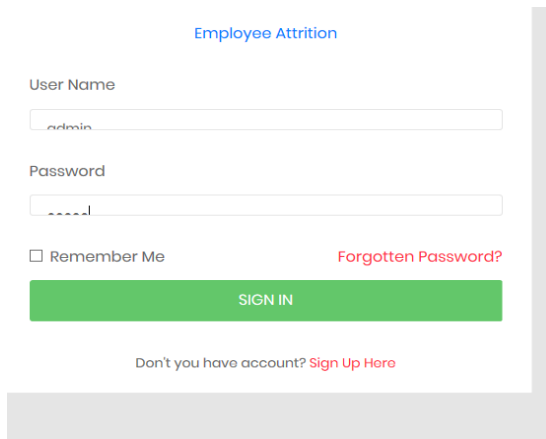
If a user can't SIGN IN, then the user needs to register an account. Here the user will enter their first name, last name, phone number, email ID, login ID, password, and then click the sign-in button. The user's information is registered. After registration, the user can login to the page.

### *Procedure 2: Filling Employee Personal Information portal*

If a user needs to add employee details, then the user needs to fill the personal information: Info I, Info II, Info III. In personal details, the user needs to add username, email ID, contact, age, gender, marital status, education, education field, number of companies worked, job role, department, and total working years.

### *Procedure 3: Filling the information of employee on Info I portal*

At the next level, the user needs to fill Info I, which includes job level, job satisfaction, monthly rate, training time, work-life balance, years at company, years at current role, years since last promotion, years with current manager, and as he or she is doing overtime. And then by saving the information, the user needs to move to the next level, which is Info II.



Employee Attrition

User Name

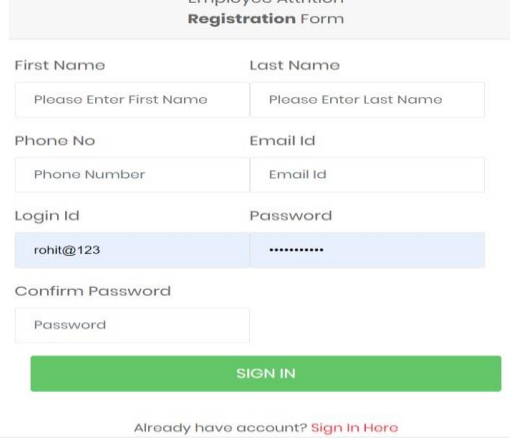
Password

Remember Me Forgotten Password?

**SIGN IN**

Don't you have account? [Sign Up Here](#)

Fig.2 Sign page



Employee Attrition  
**Registration Form**

First Name  Last Name

Phone No  Email Id

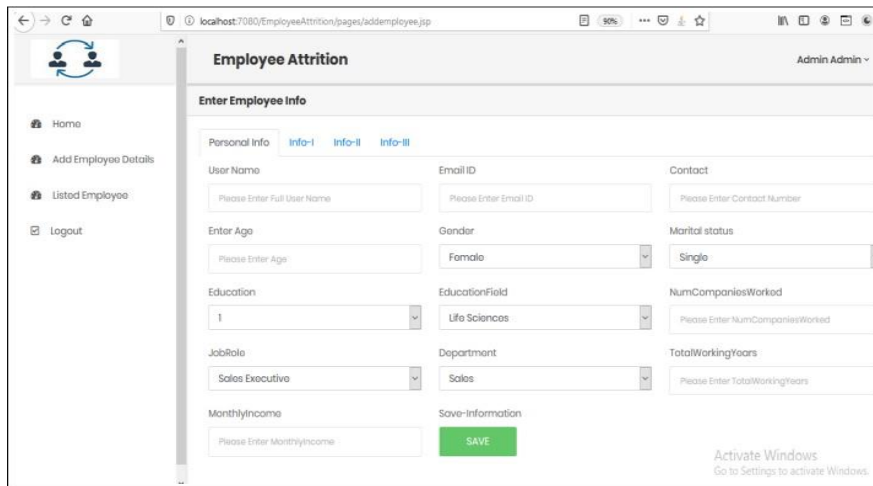
Login Id  Password

Confirm Password

**SIGN IN**

Already have account? [Sign In Here](#)

Fig.3 Registration page



Employee Attrition Admin Admin

Enter Employee Info

Personal Info Info-I Info-II Info-III

User Name  Email ID  Contact

Enter Age  Gender  Marital status

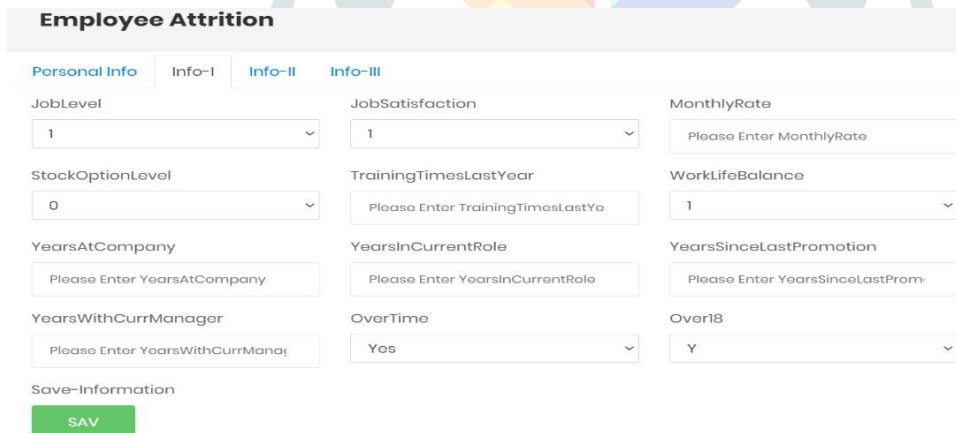
Education  EducationField  NumCompaniesWorked

JobRole  Department  TotalWorkingYears

MonthlyIncome  **SAVE**

Activate Windows  
Go to Settings to activate Windows.

Fig.4 Personal Info portal



Employee Attrition

Personal Info Info-I Info-II Info-III

JobLevel  JobSatisfaction  MonthlyRate

StockOptionLevel  TrainingTimesLastYear  WorkLifeBalance

YearsAtCompany  YearsInCurrentRole  YearsSinceLastPromotion

YearsWithCurrManager  OverTime  Over18

Save-Information **SAV**

Fig. 5 Info I portal

Procedure 4: *Filling the information of employee on Info II portal and Info III portal*

User needs to enter the details of like Percent salary hike, Employee count percentage salary Hike, Performance Rating, Relationship Satisfaction, Standard Hours. Again, by uploading the Image in Info III and by pressing the submit button it will save the Information. And then By checking for attrition of employee it will display Employee may do attrition or not going for Attrition.

Fig. 6 Info II portal

Fig.7 Info III portal

### Procedure 5: Check for attrition of employee

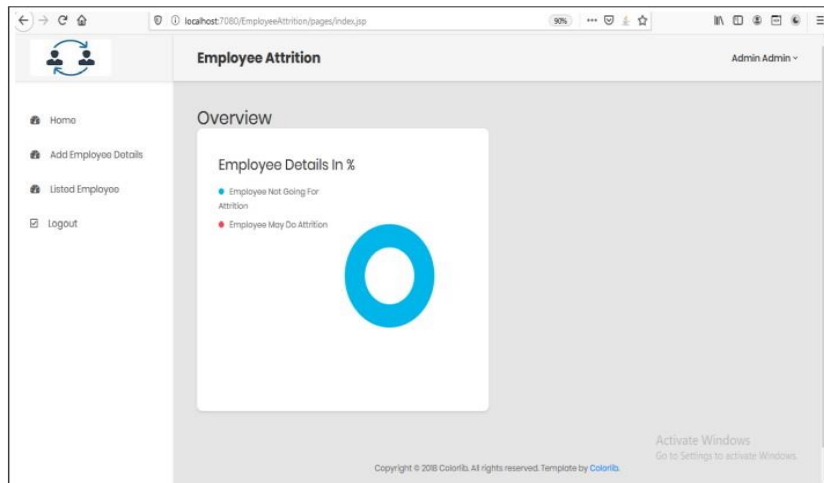


Fig.8 Check for attrition

## VI

## CONCLUSION

Human Resource is the main pillar for any organization. The growth level as well as market penetration are duly depending on the strength of the employees. Now a day due to increased population and people with high competency makes great success for any firm. But the prime issues which are normally addressed in any organization are only the attrition. This is a great challenge as well as retention is also the prime task. This system can help to implement employee attrition prediction rate in the respective organization. The analysis is done by considering some features like Monthly Income, Last Promotion Year, Current Role in Company, Salary Hike and etc. It understands the key variables that influence the employee attrition rate using machine learning. Here we are using random forest algorithm to build a prediction model for identifying the various reason for employee turnover.

## REFERENCES

- [1] Aniket Tambde, Dilip Motwani, "Employee Churn Rate Prediction and Performance Using Machine Learning", International Journal of Recent Technology and Engineering(IJRTE) ISSN: 2277-3878, Volume-8, Issue-2S11, September 2019.
- [2] Amir Mohammad Esmaeeli Sikaroudi, Rouzbehghousi and Ali Esmaeelisikaroudi, 2015 "A Data Mining Approach to Employee Turnover Prediction" (Case Study: Arak Automotive Parts Manufacturing), Journal of Industrial and Systems Engineering Volume. 8, No. 4, autumn 2015.
- [3] Riyanto Jayadi, Hafizh M. Firmantyo, Muhammad T. J. Dzaka, Muhammad F. Suaidy, Alfitra M. Putra, "Employee Performance Prediction using Naïve Bayes", IJATCSE, Volume 8, No.6, November – December 2019.
- [4] Anjali A. Dudhe and Sachin Sakhare. R, January 2018, "Teacher Ranking System to Rank of Teacher as Per Specific Domain", Journal on Soft Computing ICTACT, Volume: 08, Issue: 02, ISSN: 2229-6956.
- [5] Rohit Punnoose and Pankaj Ajit, 2016 "Prediction of Employee Turnover In Organizations Using Machine Learning Algorithms", International Journal Of Advanced Research In Artificial Intelligence, (IJARAI) Volume.
- [6] İbrahim Onuralp Yiğit, Hamed Shourabizadeh, "An approach for predicting employee churn by using data mining", 2017 International Artificial Intelligence and Data Processing Symposium (IDAP).