

# Data Driven Solution to Employee's Attrition

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Every employee plays an important role in an organization. Especially good employees, they have a high value that can't be replaced for reasons such as the deep understanding of the organization. They also have the knowledge to help improve the organization. Typically, valuable employee established a good relationship with their clients and colleagues, so their attrition has a big negative influence on the clients and colleagues. First, we explain employee Attrition; it means the voluntary or involuntary reduction of staff or employee in an organization. Attrition can be due to many factors such as employee retirement, employee resignation, contract termination, and so on. Employee attrition has a negative impact on corporate's culture and the organization's reputation. Employee attrition forces organization to hire and train new employees which requires time and it is very costly. So, our research uncovers the factors behind employee's attrition and the quality of employee's performance at work.

In our research, we analyze the IBM HR Employee-Attrition and Performance fiction data using logistic regression to discover the reasons behind employee's attrition. The data consists of 1470 subjects and 35 variables. The 35 variables focus on demographics characters of the employees and work environment-related information. We can define Logistic Regression as the predictive analysis that is used to describe data and to explain the relationship between one dependent binary variable and independent variable/ variables. In our research, the dependent binary variable is "Attrition" and responses are "yes" or "no". Our analysis began with the use of all possible 34 independent variables to observe their effect and significance on the dependent variable "Attrition". Then, we performed three types of model selection methods: best subset selection, forward stepwise selection, and backward elimination, to obtain the best model. Then, we fitted a new model that consists of the significant independent variables only. Finally, we confirmed the significance of the selected model using cross-validation and data visualization.

The analysis results confirm that nineteen variables effect valuable employee's decision to leave an organization. Some of the demographic personal variables such as "marital status", "age", "education level", and "relationship satisfaction" are out of the organization's control. Therefore, the organization is unable to reduce employee attrition due to demographic reasons. In the meantime, some other variables such as "job role", "number of years since last promotion", "overtime", "life-work balance", "home-work commute", and many others can be easily fixed to maintain valuable employees. For example, an organization could improve their work environment and provide a better life-work balance to maintain valuable employees and help them perform best at their jobs.

In conclusion, we advise the organization to avoid attrition by providing better work environments. They are many studies confirms that if employees enjoy their job their performance at work improves. Also, these employees are less likely to leave their job.