Project Report: Employee Performance Analysis

Project Name : Employee Performance Analysis, INX Future Inc.
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Submitted by : Vivek Choudhury
Institute : Datamites, Bengaluru, India.
Contact : +918718913705
Email : vivek.choudhary112@gmail.com

Overview and Motivation

The goals of our project are to establish key learnings relating to employee performances of INX Future Inc. Various capabilities of Machine Learning have been used to analyze the data and find the core underlying causes of employee performance. The findings of this project will help identify factors which affect performance ratings, support right course of actions to address under-performance and present recommendations to improve hiring efficiencies to INX Future Inc.

The dataset provided was of very good quality and required minimal cleansing work before proceeding to data exploration. One of the challenges faced was that categorical variables were high and it was required to convert them into numerical values thereby, initially increasing the complexity.

Problem statement

Listed below are the four target outcomes of this assessment.

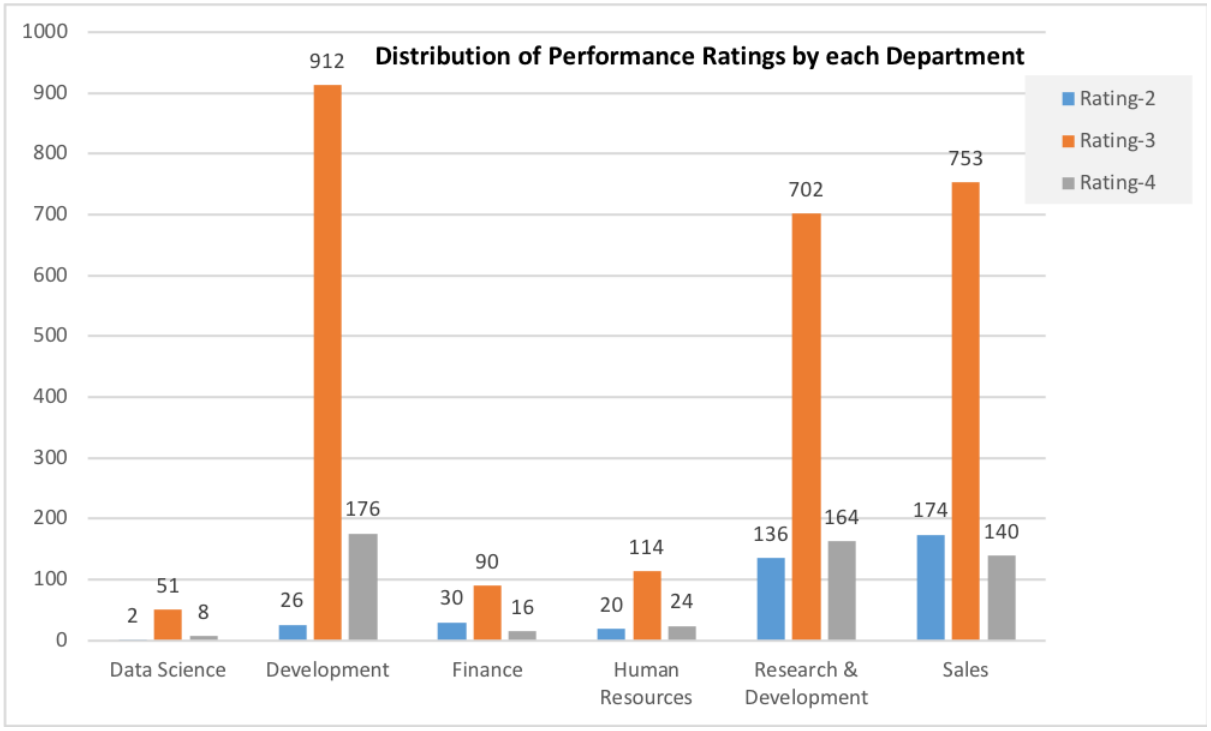
1. Department wise performances.
2. Top 3 Important Factors affecting employee performance.
3. A trained model which can predict the employee performance based on factors as inputs. This will be used to hire employees
4. Recommendations to improve the employee performance based on insights from analysis.

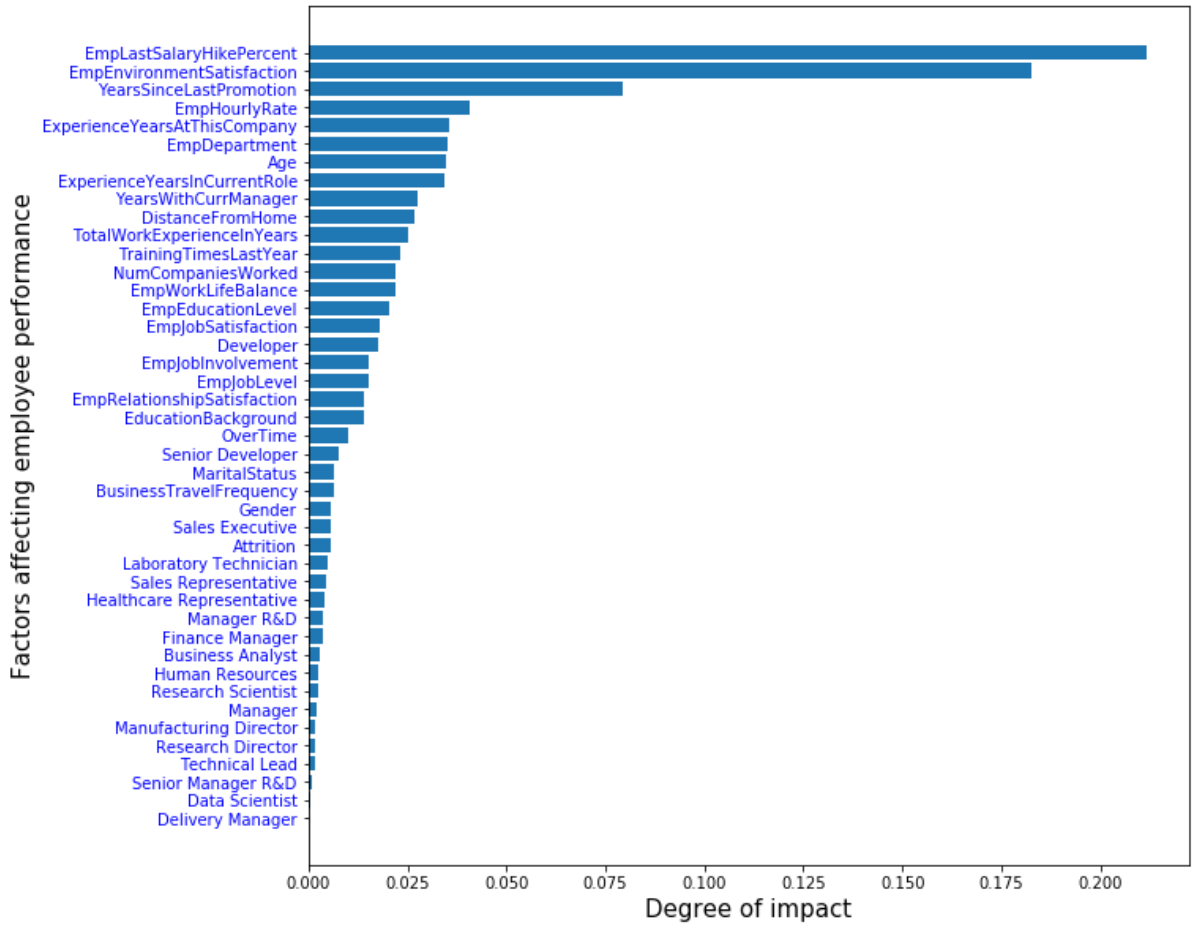
Model building

To establish an efficient trained model to predict employee performance, as first step, building a Random forest model without feature selection which showed an acceptable efficiency of 90% however, to push the possibilities, K-Nearest Neighbor model was built which had 81% efficiency, which was lower than our previous model. The final step of using Random Forest along with feature selection which provided 93% efficiency, which was the best and hence was considered for selection.

Model	Efficiency
Random_forest_model	0.9041
Random_forest_model2	0.93
knn_model3	0.8125

Key visualizations addressing target outcomes





Recommendations to improve the employee performance based on insights from analysis.

1. Job Aspirants between 31 years to 40 years of age tend to Perform better at Ranking 4.
2. Job Aspirants with +15 years total experience tend to be average performers. (Rating3)
3. Job Aspirants with 12 to 15 years of experience show higher probability of better performance (Rating 4)
4. Job Aspirants with 1 year of experience have very high probability of high-performance however, these candidates also have at least 50% probability of attrition.

Thank you!