Salifort Motors Turnover Prevention: Machine Learning Results

Champion Model 1: Best Predictive Power

ISSUE / PROBLEM

- Employee turnover at Salifort Motors is a major problem as we are committed to ensuring employees receive adequate training and support during their employment.
- Our goal is to develop a machine learning model that can predict and, in turn, help prevent turnover.

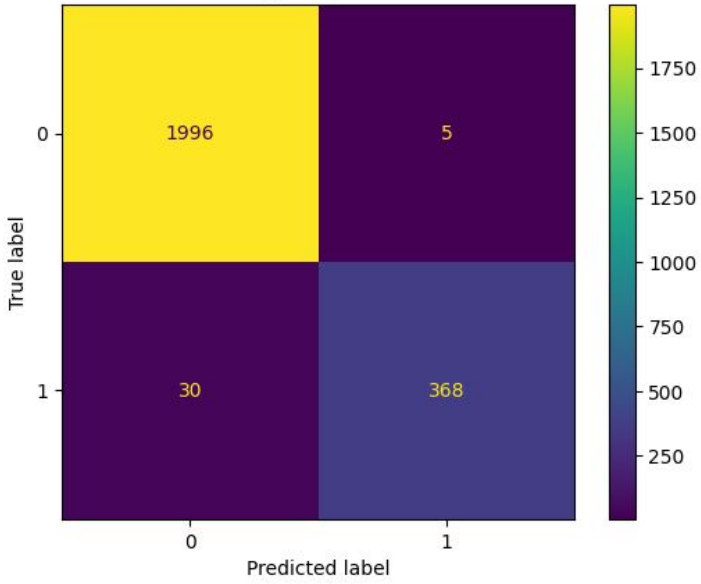
RESPONSE

- A thorough EDA of Employee Satisfaction data was used as the basis for determining which Machine Learning Models (MLM) would be sufficient for this data.
- Five rounds of model testing were performed by separating the data into a training, validation, and an unseen champion set.
- The final models were chosen based on the highest predictive power and actionable insights.

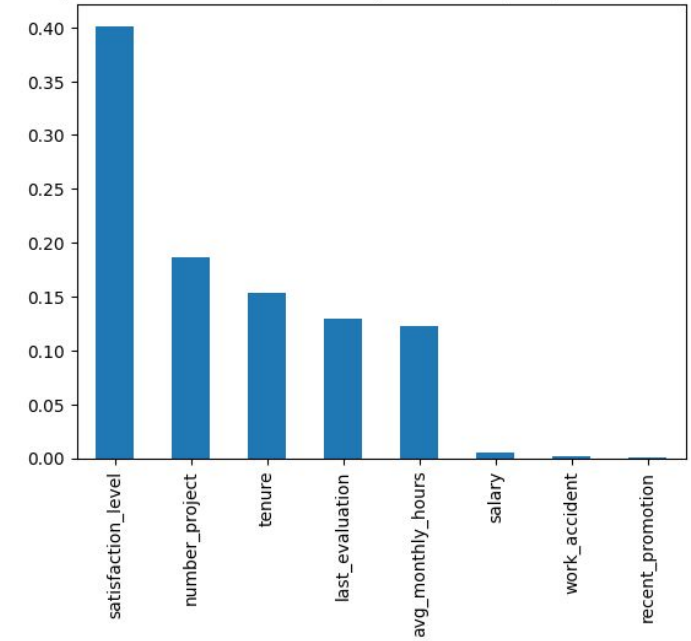
IMPACT

- This model has very predictive power and easily distinguishable features.
- However, these features, as shown in the full report, are harder to act upon.
- Satisfaction level and last evaluation scores were shown to have some bias.
- This model would be excellent if the explicit goal is to only predict which employees are likely to leave.

Champ 1: Random Forest Model w/o Department + Outliers Confusion Matrix



Champ 1: Random Forest Feature Importances w/o Department + Outliers



KEY INSIGHTS

- This model's **F1 score was 0.954604.** This was driven by a very strong precision score of **0.986595** and a good recall score of **0.924623.** The accuracy and AUC score was **0.985411** and **0.980127** respectively.
- Out of the top 5 important features, **satisfaction level was found to be a very strong predictor of turnover followed by number of projects, tenure, last evaluation, and average monthly hours.**
- Satisfaction level and to a lesser degree last evaluation scores were shown to have unusual score distributions across different variables. This suggests some form of data collection bias was observed.
- Despite the observed biases and features being less actionable, this model had the highest predictive power and would be excellent at making predicting future employee turnover if solutions to resolve turnover are delayed until a later date.
- See the **Suggested Solutions:** in the full report for suggested solutions to reduce employee turnover.