

# LEAVE OR STAY?

*What contributes to employees' final decisions*

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## Abstract

Prevent employee from leaving is crucial for most of the companies. In this report, we would like to figure out what contributes to employees' decision of leaving. First of all, we go through the categorical features and numerical features separately, trying to summarize quit patterns. Among all the patterns, satisfaction level has the most impact on quit rate. Next, we try to explain special cases where satisfaction level doesn't work. That is, the reason why some people with high satisfaction level still leave the company while some people with low satisfaction level choosing to stay instead. Based on our analyze, it is suggested that when several quit patterns happens in one person at the same time, the possibility of quit could be greater. The following paragraphs will explain these statements in details.

*Keywords: company, employee, quit rate, improper workload, satisfaction*

## Initial Glance

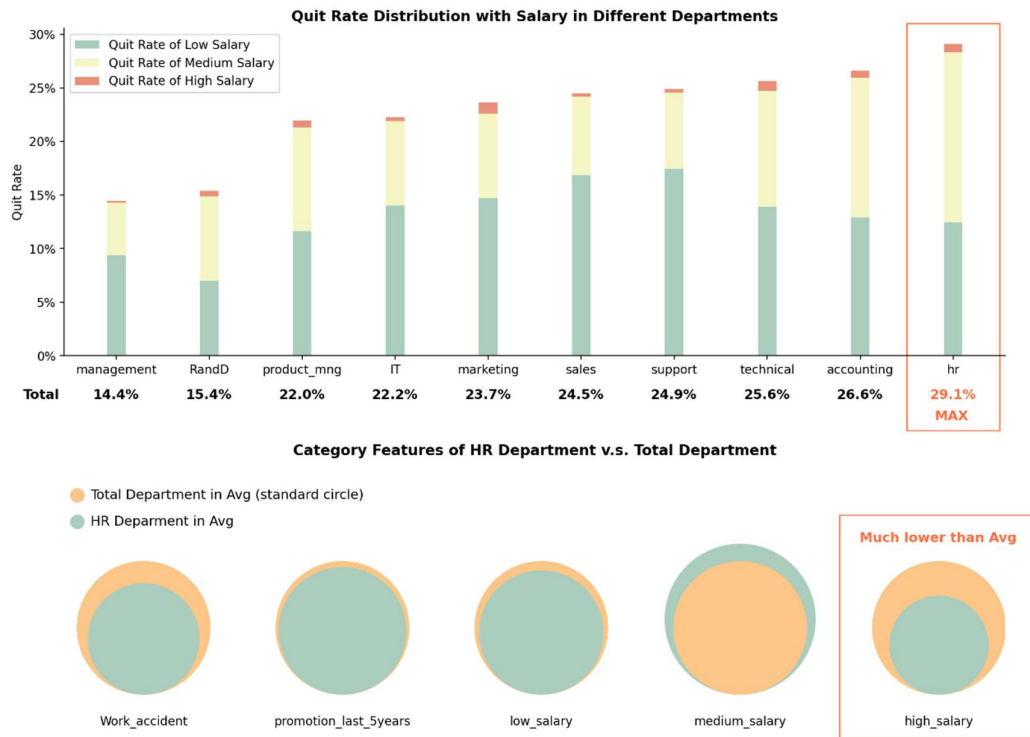


Figure 1 Salary vs. Department: HR department have the highest quit rate among all departments.

In order to get a clear glance of the whole data distribution pattern under category features, we compare different categories and finally choose salary and department, which could generate obvious patterns about leaving or not by making a cross analysis for quit percentages.

According to Quit Rate Distribution with Salary in Different Departments (Figure 1), we figure out a common pattern for all departments: low salary groups have higher quit rate than high salary groups (low > medium > high). Furthermore, we also found that the HR department has the highest total quit rate among all departments. However, what the most interesting finding is that HR department's medium-salary quit rate is higher than low-salary quit rate. Thus, we dig deeper into the data of HR department, trying to figure out the reason why HR department has an inverse pattern when comparing quit rate between low salary group and medium salary group. We compared the statistics between HR department and total departments, finding that the percentage of high salary people is much more lower than total department average. To some extent, the reason behinds high quit rate in HR department could be the much more smaller percentage of high salary group indicates that it is unlikely for the employees in HR department to have higher salary after they reached their limit at a 'medium salary level'.

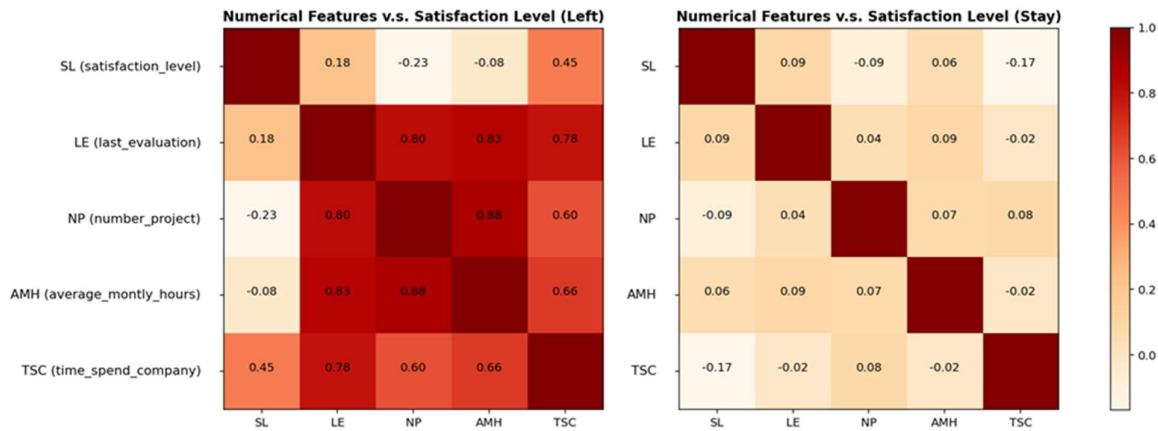


Figure 2 Heat map: correlations between numerical features. Patterns for left group seem to be obvious, while patterns for the stay group seems to be ambiguous.

After having a first insight about the influence of different salary levels, we take the next step: building a heat map to find data patterns between numerical features. Since employees' attitude towards their company is a more intuitive and quantitative indicator, we choose satisfaction level as a critical factor in the heat map. According to the heat map of numerical features vs. Satisfaction Level (Figure 2), we separate all data into two groups: left and stay. The numerical features have medium to strong correlation with each other in the left group, while correlation of patterns for the stay group seems to be trivial. Among these features, commuting time has a high correlation with satisfaction level and average monthly work hours has a strong correlation with the number of projects. Therefore, we could explore data under the relationship between these numerical conditions for further information.

## Finding Characteristics

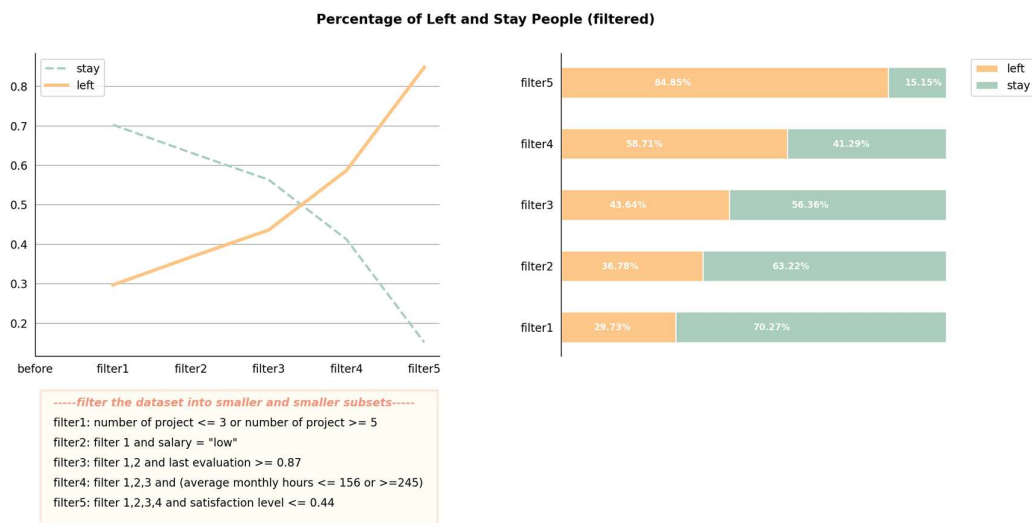


Figure 3 Filtering subsets: trying to find specific combination of features that makes people leave

Now we have some rough ideas about the features and their relationships, it's time to explore the core question: what makes people stay or leave? In order to find out how the combination of these variables influence the final decision of leaving the company, we use 5 filters decided by 0.25 & 0.75 quantiles in *Figure 3* to focus on a specific group of people. As a result, 84.75% of employees in this characterized group choose to leave the company. Therefore, based on the slope of the line, we could make a suggestion that improper number of projects (both too small and too large), low amount of salary, long time since last evaluations, extreme amount of monthly average working hours (both too little and too much) as well as low satisfaction levels are signals contribute to push the employees to make their final decisions of leaving their companies.

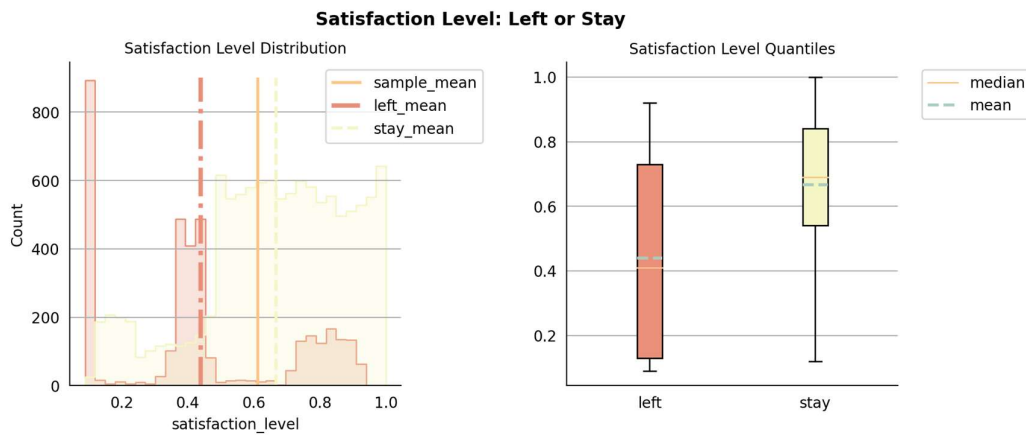


Figure 4 Distribution of satisfaction: extreme clusters for left group

As shown in *Figure 3*, the slope of the line when we move from filter 4 to filter 5 is very steep (we add the condition of low satisfaction here). Because of this, we would like to further explore the distribution of satisfaction scores among these two groups. With a much lower mean and median than the stay group, the left group reaches their maximum count at 0.1 level of satisfaction. In the meantime, the distribution of satisfaction among the stay group looks evenly, unlike the extreme case that happens in the left group. Although most of the left group data clustered on the left side (scores < 0.2 and scores < 0.4), they also have a small cluster on the right side (0.7 < scores < 0.9). The following paragraphs will explore this situation in more details.

## Special Cases

Satisfaction is a direct index of employees' attitude toward the company. However, there are so many employees with low working satisfaction who still stay at the company. In the meantime, many high satisfaction members also choose to leave. We conducted further research on these two questions.

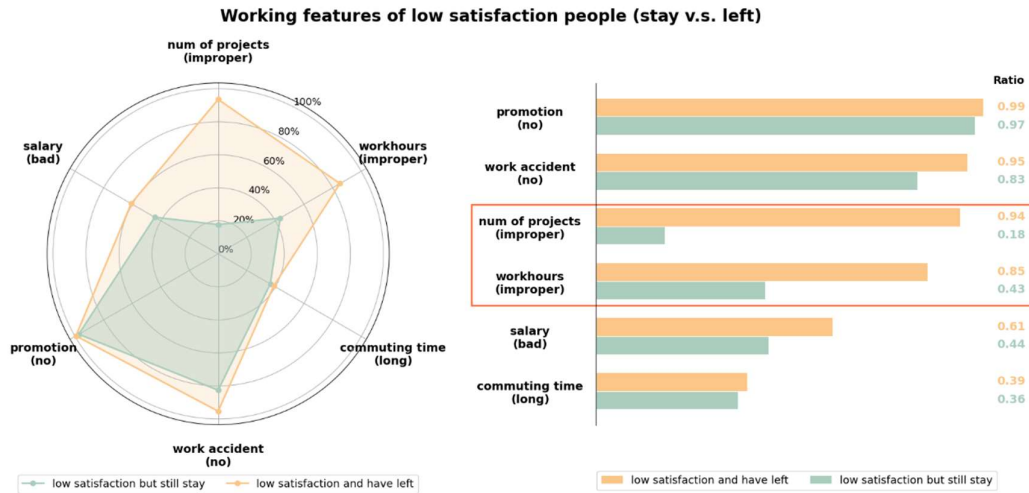


Figure 5 Working features of low satisfaction people: improper working load makes people leave. Definition of 'improper' is made by quantile results: here we use num project  $< 3$  or num project  $> 5$ ; average working hours  $< 156$  and average working hours  $> 245$  and commute time  $> 3$ . Other features include no work accidents, no promotions, as well as low salary levels.

As shown in Figure 5, we carefully set up the filter conditions of working features and displayed their ratios of left and stay people in the low satisfaction group in the two subplots of Figure 5 separately.

For most low satisfaction employees who still stay at the company, unlike other member who choose to leave, a much lower ratio of improper workload, including extreme amount of working hours and number of projects (both too little and too much), is the main reason for them to keep a sense of belonging to the company.

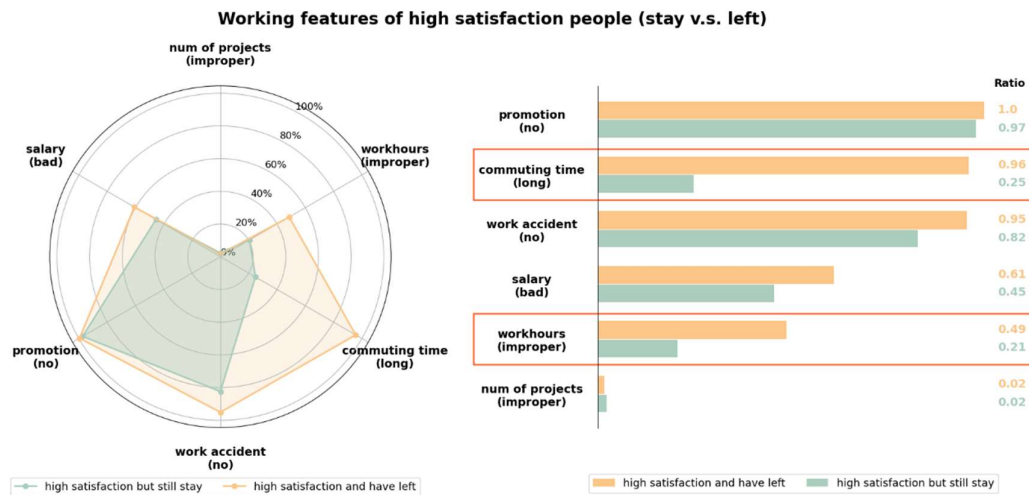


Figure 6 Working features of high satisfaction people: improper working hours and commuting time make people leave. Definition of 'improper' is made by quantile results: num project  $> 5$ , working hours  $> 245$  and commuting time  $> 3$ . Other features include no work accidents, no promotions, as well as low salary levels.

Simultaneously, we use similar filter conditions of the working features described in *Figure 6* and displayed the ratios of left and stay people in the high satisfaction group in the two subplots of *Figure 6* separately.

For those high satisfaction employees who chose to leave, spending more than 3 hours per day on commuting, hard working more than 5 years without promotion, and the lack of working accidents is common experience for most of them. Although they have higher satisfaction levels, tolerating hustling and bustling, the terrible commuting experience and imbalanced working hours compared to spare times, which are considered the main reasons for them to leave, finally made them too tired to stay in the company.

### **Conclusion**

These reasons, which are the same as our filtered percentage result shown in *Figure 4*, help us separate the left group and stay group in the company. In conclusion, low satisfaction level, improper amount of working time (both too large and too small), low salary as well as low possibility of having higher salary level are main characteristics of the left group. In addition, employees might leave the company even when they are satisfied with their companies, which caused by the imbalances between work and life. On the other hand, the stay group has moderate amount of working time, commute time, as well as moderate amount of salary, which make them still stay even when they have lower scores of satisfaction level toward their companies.