

# Improving retention of high-performing employees

A QuantSpark<sup>▼</sup> assessment.

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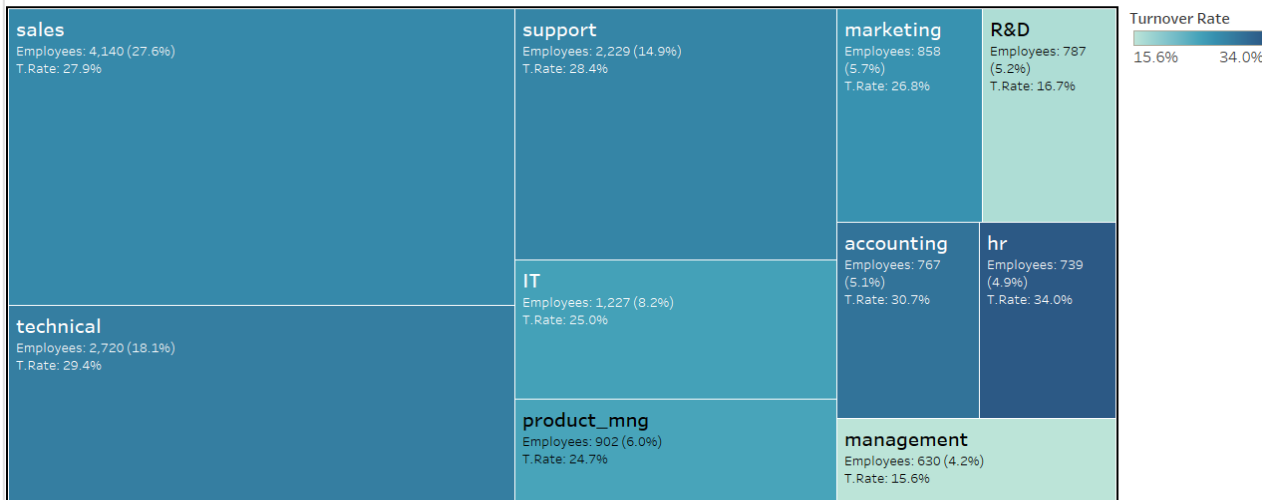
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## 1. Data Overview

Higher turnover rates\* were found in HR and Accounting with 34% and 31% respectively

Number of employees and turnover rate by department



Total: 15,000

- **Sales, technical** and **Support** departments comprise **60%** of total employees.
- The dataset contains information of **15 K** employees, where **24%** of them already left the company.

*At first glance, R&D has the lowest turnover rate (16.7%) and HR the highest (34%).  
Is there something that R&D is doing differently from HR?*



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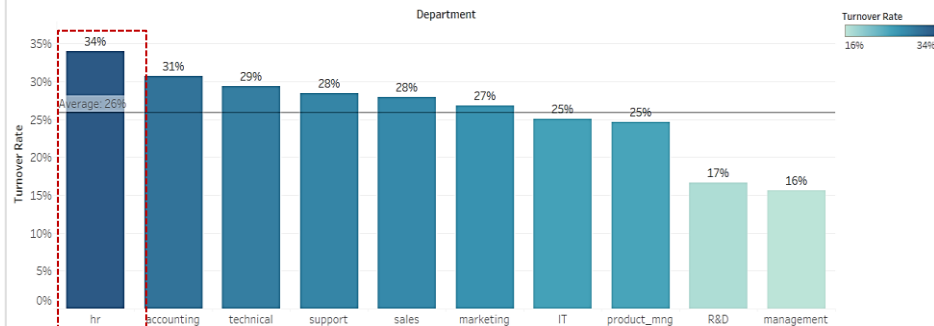




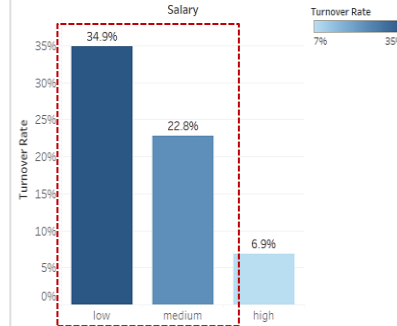
## 2. Key Findings

**Total vs. high performers\*: Turnover rate increases on average (+7 pp) and are more prominent in low and medium salary levels**

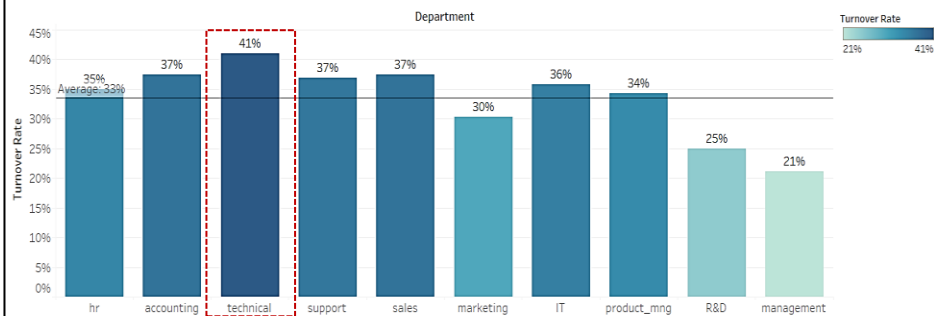
Total turnover rate across departments



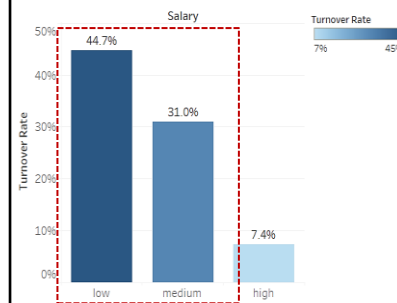
Total turnover rate by salary levels



Top performers' turnover rate across departments



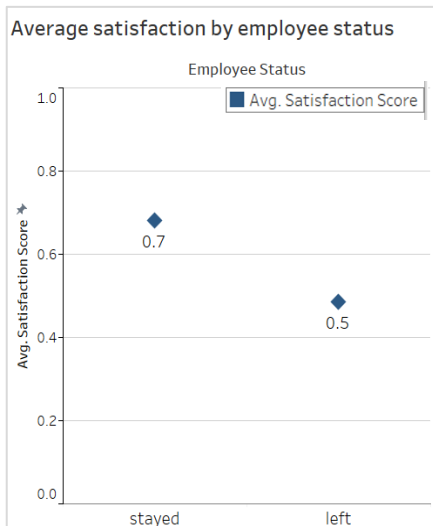
Top performers' turnover rate by salary level



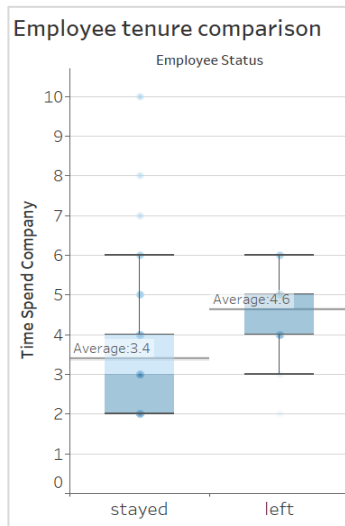
- ✓ On average, high performers turnover is **7 percentage points** (pp) higher than the total average.
- ✓ The loss of talented individuals is more noticeable in the **technical** department.
- ✓ Relevant turnover changes can be seen in **low** and **medium** salaries with **9.8 pp** and **8.2 pp** increases respectively, **signalling a potential factor for employee tenure**.

## High performers: How leavers compare to non-leavers?

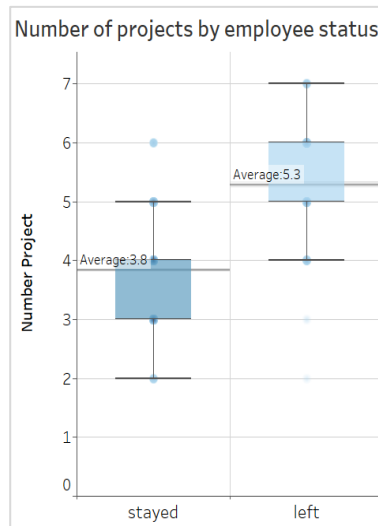
Satisfaction, time in company and number of projects influenced top performers decision to leave



**Leavers** satisfaction is **40% less** than the ones who stayed.



**Leavers** had spent **35% more** time in the company than those who stayed.



The average number of projects in **leavers** is **x1.4 times higher** than non-leavers

- *There is a necessity to **retain** employees with longer time in the company*
- *Number of projects, exhibit a **higher** workload in leavers*

*How can satisfaction be increased?  
How can the workload be reduced?*

## High performers: How leavers compare to non-leavers?

Leavers did not receive promotions and used to work more hours per month

Working time differences between top and non-top performers by employee status

Top Performers	Salary	Employee Status			
		stayed		left	
		% Diff	Avg. Monthly Hrs	% Diff	Avg. Monthly Hrs
0	low		196.6	-18.87%	159.5
	medium		197.0	-17.93%	161.7
	high		197.3	-21.79%	154.3
1	low		202.3	26.93%	256.8
	medium		203.3	26.43%	257.0
	high		206.9	29.48%	267.9

High performers that left used to work **26% more monthly hours** than the ones that did not leave.

Promotions in the last 5 years by employee status and salary level

Employee Status	Salary	Promotion Last 5Years			
		No		Yes	
		% of Employees	Num. Employees	% of Employees	Num. Employees
stayed	low	99%	1,807	1%	19
	medium	96%	1,739	4%	67
	high	96%	350	4%	16
left	low	100%	1,052		
	medium	100%	661	0%	1
	high	100%	28		

On average, almost **4%** of the top performers employees currently in the company had received a promotion.

*How can hard workers be rewarded?  
Is overtime being controlled?  
Are employees being compensated rightfully?*





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## Correlations and the machine learning algorithm\* further corroborate the influence of previous variables on the target (“left”)

### Correlation analysis



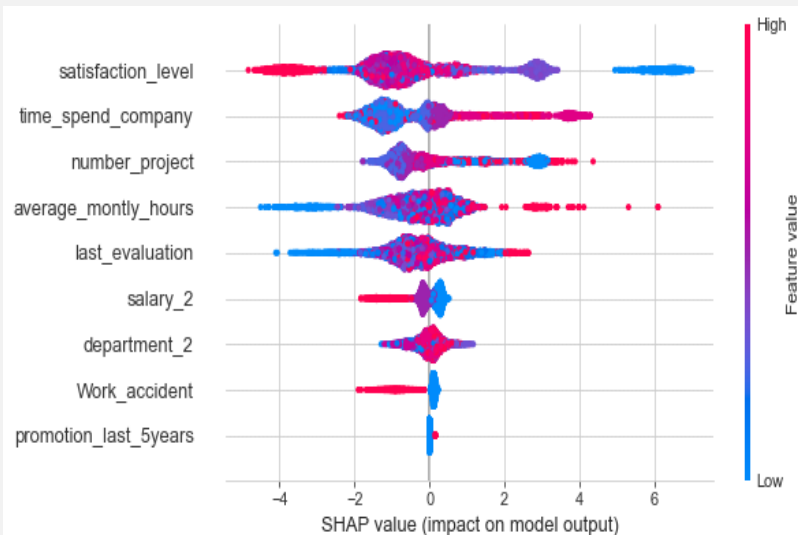
**Moderate** linear relationships were found in:

- Last evaluation
- Number of projects
- Monthly hours
- Time spend in company

**Less** influential variables were:

- Satisfaction
- Work accident
- Salary
- Promotion last 5 years

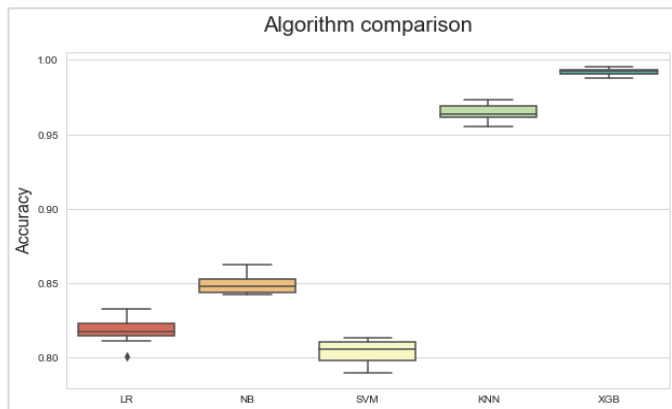
### Machine learning: Impact of each variable on output (0|1)



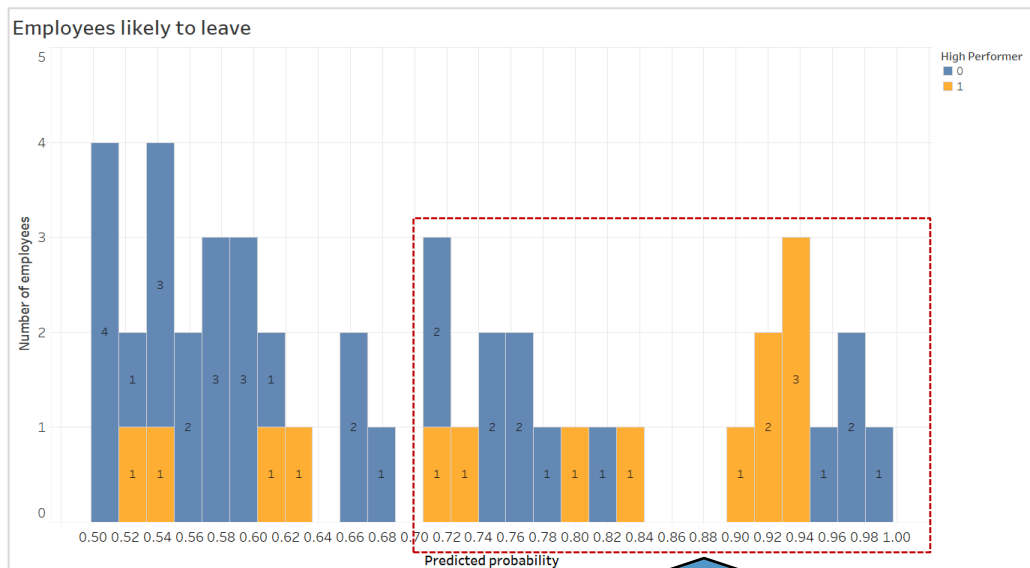
*Most variables' importance match in both methods.*

### 3. Predictive modelling

The XGBoost model was selected, being able to identify 22 employees with a high propensity to leave, 10 of them were high performing



Based on model performance (more than 97% accuracy), the XGB model was chosen for this task



The model predicted 22 employees that have more than 70% probability to leave, 10 of them were high performing



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### What can be done?

#### Check what others are doing

Based on the turnover rates, investigate what other departments are doing right with their staff.

#### Thank employees that have a long company trajectory

Make employees feel appreciated for their loyalty (gifts, awards), which may also lead to an increase in their satisfaction.

#### Reward hard workers

Reward high performers that work overtime or on multiple projects ie., bonuses, half a day off, recognitions, etc.

#### Salary review

Perform salaries reviews periodically based on employee performance.

#### Explore other approaches to increase satisfaction

Focus on factors that may improve overall satisfaction, such as employee training, feedback delivery, mental-health budget, etc.

