# HR analysis for Company X

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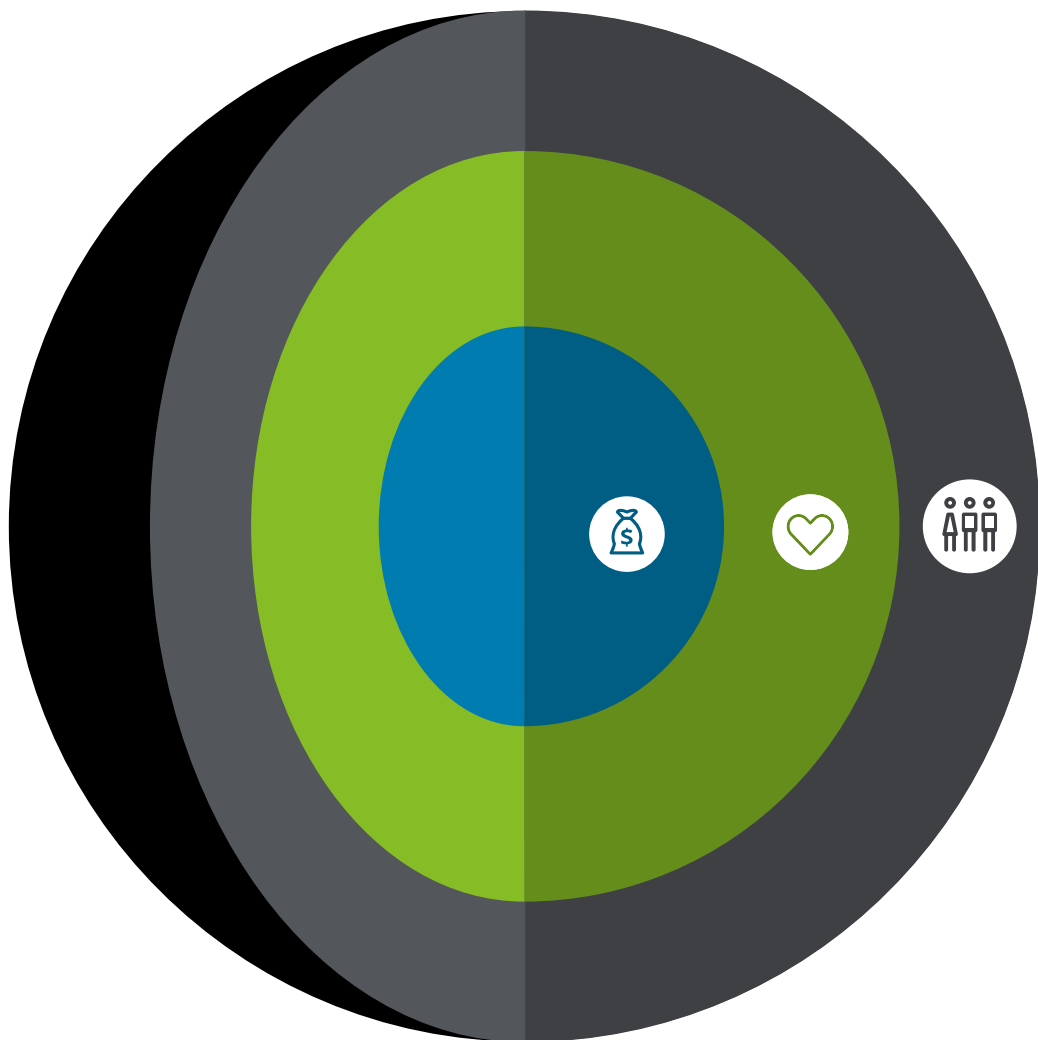
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~19.27%

Attrition Rate

**0** **Summary**: In-depth, the rationale of high attrition rate is related to **unreasonable compensation structure**, including both short- and long-term incentive plan, which also induced job satisfaction and promotion problem

**Organization Talent Review**

Page1, 2

- There are four types of employees in company X, including **Young Star, Senior Stuff, Average Loyal Junior** and **Normal Flower Heart**
- Normal Flower Heart is the group of employee most likely to leave the company

- In company X, **high performance** can predict **high salary increase**
- People who stay longer years at company, more likely to have **long promotion interval time**, and **have longer time with his/her manager**

**Attrition Analysis**

Page3

- According to Pearson Correlation Coefficient, no variables have more than .2 abs correlation
- Five types of variables have relatively high SHAP impact on attrition, including **job satisfaction, income, number of companies have worked, promotion interval** and **working years related variables***
- Normal Flower Heart also considers **training, single status**

**Satisfaction Analysis**

Page4

- Among all four types of employees, Normal Flower Heart has the **lowest average job satisfaction score**
- Dig into the satisfaction rationale of Normal Flower Heart, it showed that the top influential factor is **income**

**Compensation Diagnosis**

Page5

- Current compensation initiative will reduce the attractiveness of promotion, due to **unreasonable stock option structure** and **"level up with pay down" problem**

- Please play the link to predict your income and experience the "pay down" problem: https://wangzhennn-hranalysis-app-to4gda.streamlitapp.com/
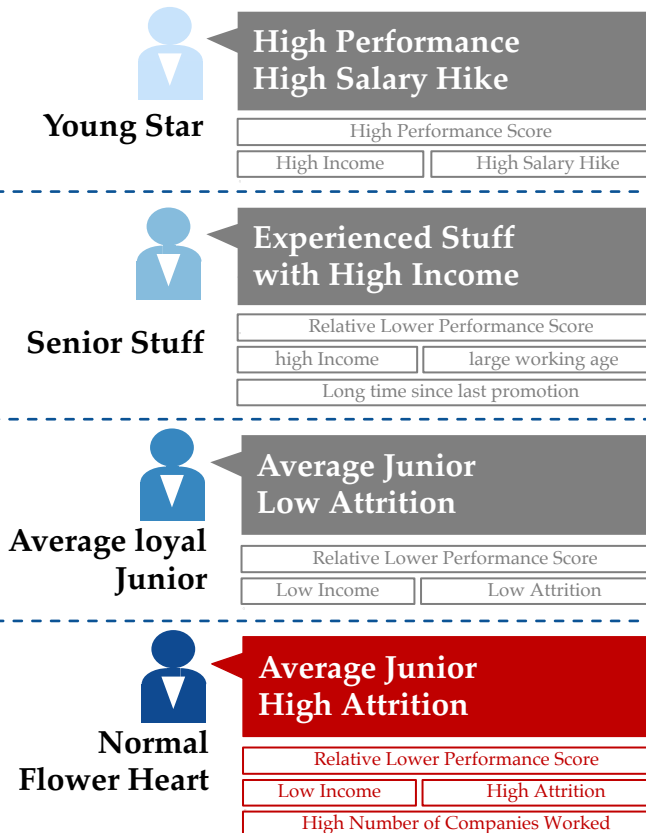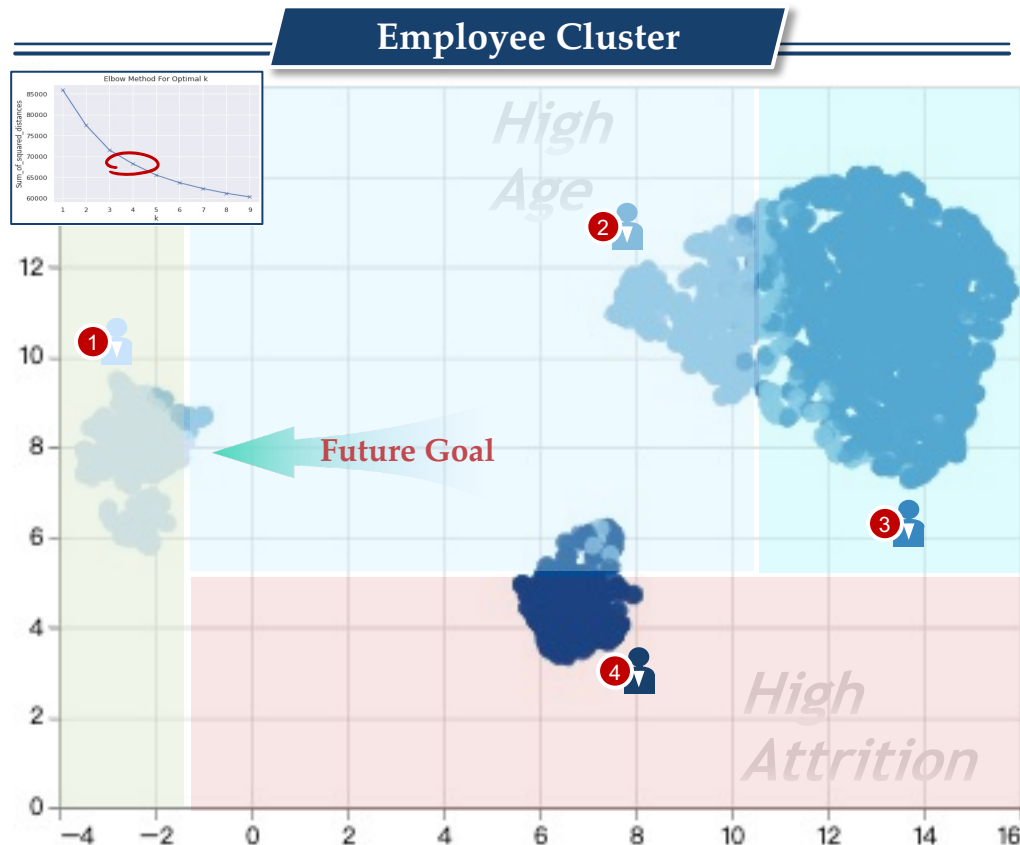
2

**Note:**
1* **working years related variables** refers to years with manager, years at company, years of working

# 1 Organization Talent Review (1/2)

- **Organization Talent Review(OTR)** is a powerful human resource management tool, which helps company to **visualize both team and individual performance,** and generate **future talent acquisition and development strategy** based on OTR outcome. High-profile advocates such as Jack Welch at General Electric (GE) and consultancies such as McKinsey have led the discourse around the **"War for Talent"** (Hongal & Kinange, 2020)
- **Talent Sudoku** is a common way to implement OTR with manual computation on employee's individual variables. However, empowered by artificial intelligence, we can use **Clustering Algorithm** to profiling employee. For Company X, there are **four types of employees** in company X, dividing mainly by **performance, attrition** and **age**, in which **"Normal Flower Heart" group** should draw our attention to analysis the rationale

## Employee Cluster



**Future Goal**

**Young Star**

**High Performance High Salary Hike**

| High Performance Score | |
| --- | --- |
| High Income | High Salary Hike |

**Senior Stuff**

**Experienced Stuff with High Income**

| Relative Lower Performance Score | |
| --- | --- |
| high Income | large working age |
| Long time since last promotion | |

**Average loyal Junior**

**Average Junior Low Attrition**

| Relative Lower Performance Score | |
| --- | --- |
| Low Income | Low Attrition |

**Normal Flower Heart**

**Average Junior High Attrition**

| Relative Lower Performance Score | |
| --- | --- |
| Low Income | High Attrition |
| High Number of Companies Worked | |

## Conclusion

✓ There are **four types of employees** in company X, including **Young Star**, **Senior Stuff**, **Average Loyal Junior** and **Normal Flower Heart**

✓ Employees are mainly segmented by **performance, attrition** and **age**

✓ The **Normal Flower Heart with high attrition rate** should draw our attention to analysis the rationale of its high attrition rate

**To be discussed**

**Reference:**
1* Hongal, P., & Kinange, U. (2020). A study on talent management and its impact on organization performance-an empirical review. International Journal of Engineering and Management Research, 10.

# 1 Organization Talent Review (2/2)

| | Young Star | Senior Stuff | Average loyal Junior | Normal Flower Heart | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (median) a | 34 | 42 | 35 | 31 | | | | | | | | | | | | | | | | | | |
| Distance From Home b | 9.75 | 9.93 | 8.84 | 8.91 | 0.00 | | | | | | | | | | | | | | | | | |
| Education Level c | 2.82 | 2.93 | 2.94 | 2.87 | -0.03 | -0.01 | | | | | | | | | | | | | | | | |
| Job Level d | 2.01 | 1.87 | 2.14 | 2.05 | -0.00 | -0.04 | 0.04 | | | | | | | | | | | | | | | |
| Income e | 66,915 | 68,515 | 63,568 | 63,817 | -0.05 | -0.02 | 0.01 | 0.05 | | | | | | | | | | | | | | |
| Stock Option Level f | 0.70 | 0.77 | 0.83 | 0.82 | -0.03 | 0.01 | 0.00 | 0.00 | 0.03 | | | | | | | | | | | | | |
| Percent Salary Hike g | 21.86 | 14.19 | 14.02 | 14.17 | -0.03 | 0.04 | -0.04 | 0.01 | 0.01 | 0.01 | | | | | | | | | | | | |
| Training Times Last Year h | 2.69 | 2.77 | 2.87 | 2.65 | -0.03 | -0.01 | 0.01 | -0.03 | 0.04 | -0.07 | -0.04 | | | | | | | | | | | |
| Years at Company i | 5.91 | 15.95 | 4.78 | 3.75 | 0.31 | 0.03 | 0.01 | -0.06 | 0.00 | 0.01 | -0.03 | -0.01 | | | | | | | | | | |
| Years Since Last Promotion j | 1.58 | 6.43 | 1.00 | 1.30 | 0.22 | 0.00 | 0.03 | -0.06 | 0.06 | 0.02 | -0.03 | 0.01 | 0.62 | | | | | | | | | |
| Years with Current Manager k | 3.76 | 8.79 | 2.95 | 2.22 | 0.20 | 0.02 | 0.01 | -0.05 | 0.03 | 0.02 | -0.04 | -0.02 | 0.77 | 0.51 | | | | | | | | |
| Num Companies Worked l | 2.81 | 2.56 | 2.66 | 2.88 | 0.30 | -0.02 | -0.02 | -0.01 | -0.02 | 0.02 | 0.03 | -0.03 | -0.12 | -0.03 | -0.11 | | | | | | | |
| Total Working Years m | 10.23 | 20.00 | 9.32 | 7.00 | 0.68 | 0.00 | -0.01 | -0.04 | -0.03 | 0.00 | -0.02 | -0.04 | 0.63 | 0.41 | 0.46 | 0.24 | | | | | | |
| Performance n | 4.00 | 3.04 | 3.00 | 3.00 | -0.03 | 0.04 | -0.04 | -0.00 | 0.02 | -0.04 | 0.77 | -0.02 | -0.01 | -0.02 | -0.01 | 0.02 | -0.00 | | | | | |
| Job Involvement o | 2.74 | 2.74 | 2.73 | 2.68 | 0.02 | -0.01 | -0.02 | -0.02 | 0.03 | 0.01 | -0.00 | -0.01 | 0.01 | 0.03 | -0.00 | 0.03 | 0.00 | 0.01 | | | | |
| Environment Satisfaction p | 2.74 | 2.76 | 2.77 | 2.44 | 0.01 | 0.02 | -0.04 | -0.02 | -0.01 | -0.01 | -0.00 | 0.02 | 0.00 | 0.02 | -0.00 | 0.01 | -0.00 | 0.01 | 0.02 | | | |
| Job Satisfaction q | 2.88 | 2.59 | 2.82 | 2.34 | 0.00 | -0.01 | -0.01 | -0.02 | 0.00 | 0.04 | 0.04 | -0.02 | -0.00 | -0.02 | -0.03 | -0.06 | -0.01 | 0.05 | 0.00 | -0.00 | | |
| Work Life Balance Level r | 2.72 | 2.80 | 2.78 | 2.67 | -0.02 | 0.01 | -0.01 | -0.02 | 0.00 | -0.02 | -0.04 | -0.02 | 0.01 | 0.01 | 0.01 | -0.01 | -0.00 | -0.02 | -0.02 | 0.02 | -0.02 | |
| Attrition Level s | 0.19 | 0.07 | 0 | 1 | -0.16 | -0.01 | -0.02 | -0.01 | -0.03 | -0.01 | 0.03 | -0.05 | -0.13 | -0.03 | -0.16 | 0.04 | -0.17 | 0.03 | -0.01 | -0.10 | -0.10 | -0.06 |
| manager | 39 / 626 | 181 / 2683 | 79 / 991 | 30 / 519 | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s |

**Conclusion**

- **High performance** can predict **high salary increase**

- People who stay longer years at company, more likely to have **long promotion interval time, and have longer time with his/her manager**

- **For predicting attrition**, no variables have more than .2 abs correlation

High Score ← → Low Score

# ② Attrition Analysis

## Deal with Imbalance Sample Problem

According to Google Developers, there are 3 degrees of imbalance — mild (20–40%), moderate (1–20%), and extreme (<1%)
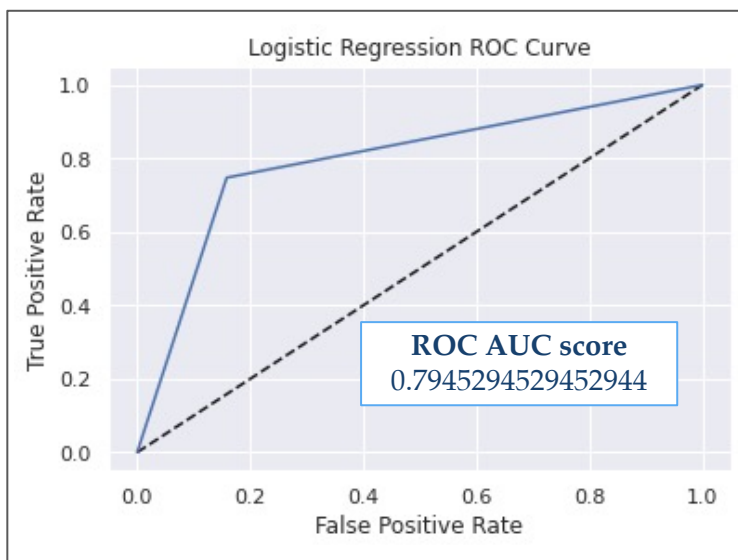
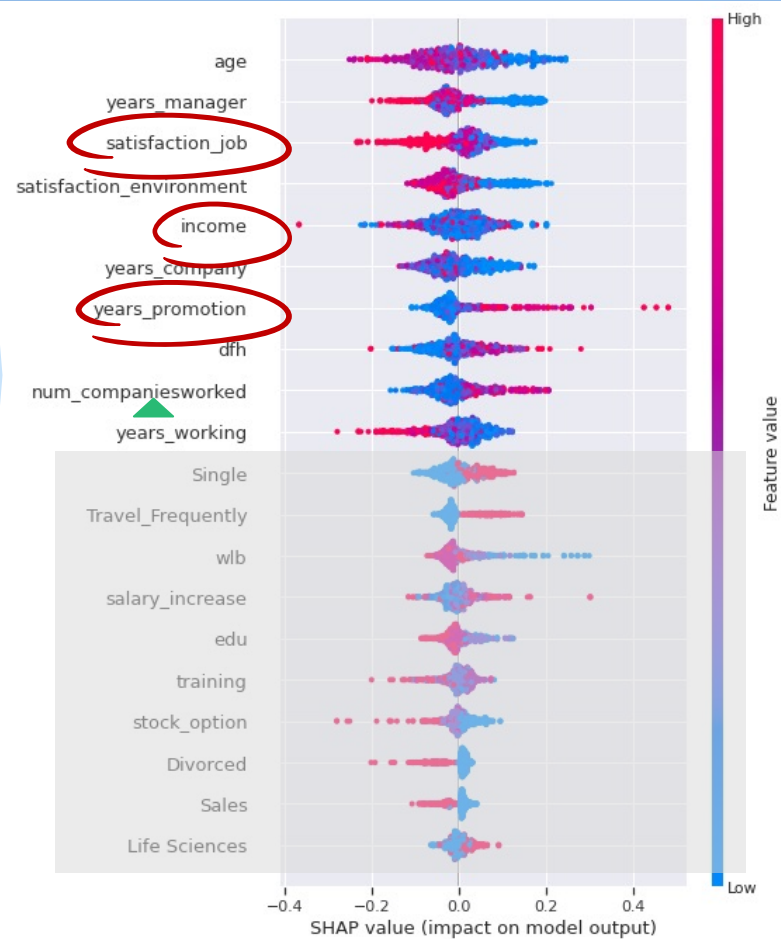- **Before undersampling**
  - 2512
  - 498
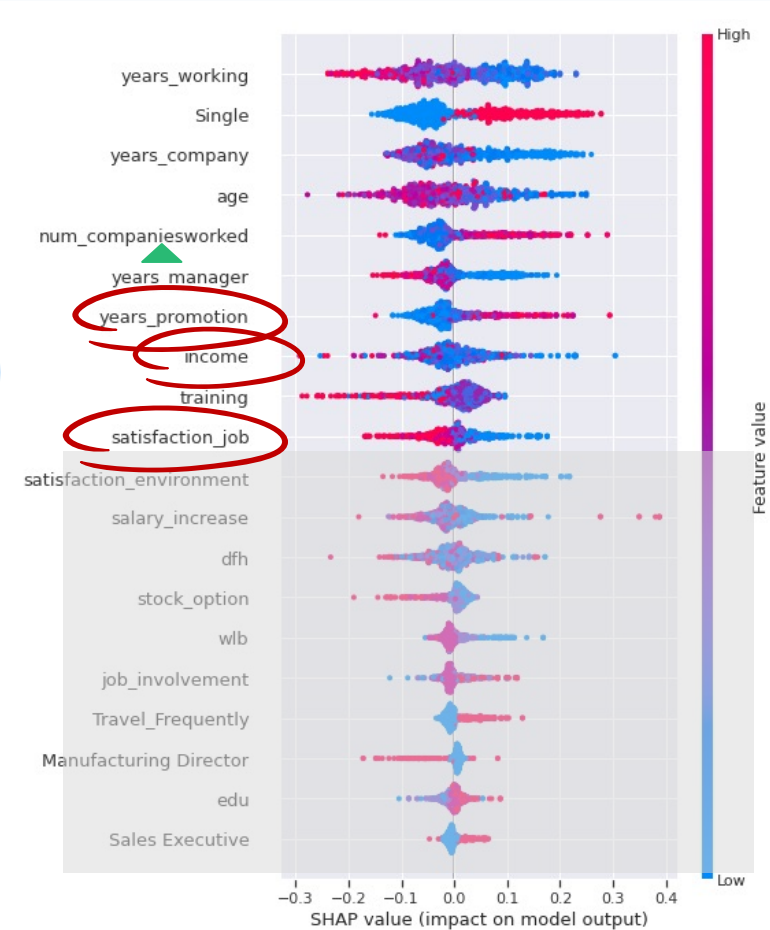- **After undersampling**
  - 498
  - 498

Overall Sample



Logistic Regression ROC Curve

**ROC AUC score**
0.7945294529452944

## Overall Sample
498 / 498

MSE 0.3083 / XGB 0.9998



## Average loyal Junior & Normal Flower Heart
492 / 492

XGB 0.9999

Which feature influence the **satisfaction** of Normal Flower Heart?
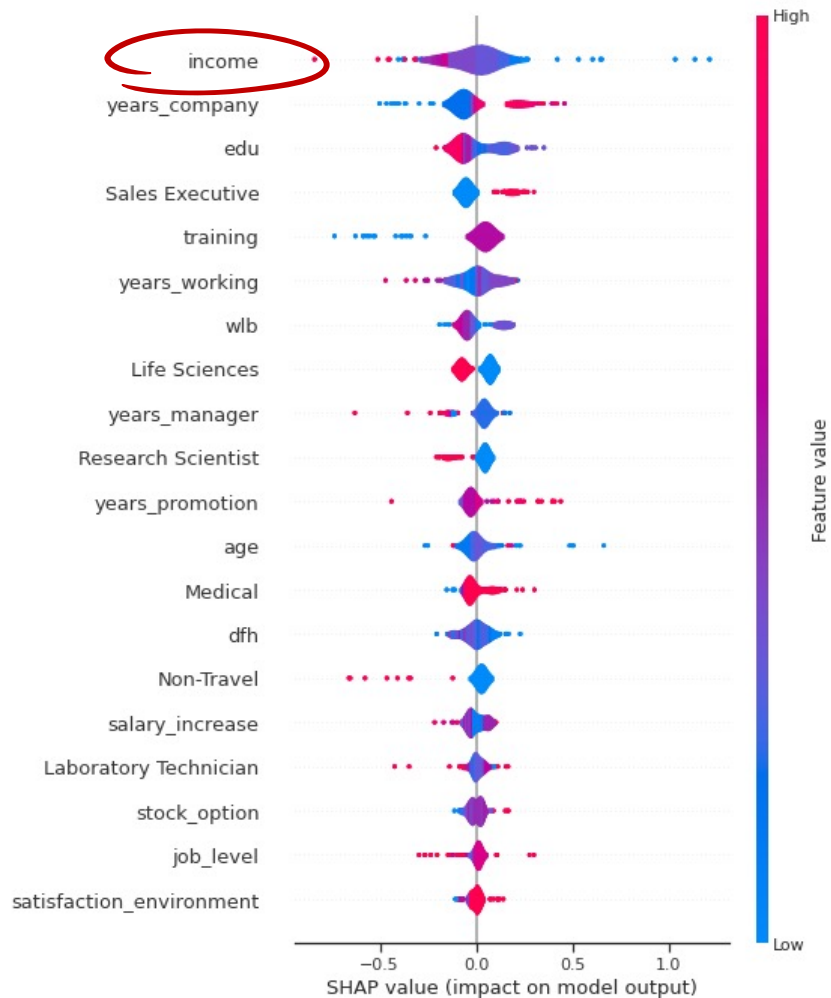
Is
INCOME
Reasonable?

Please play the link to predict your income
*based on current organization income setting*

# **4** Compensation Analysis

✓ **Material Compensation** usually includes salary, bonus, and long-term incentive (e.g. stock option)

✓ To gain compensation competitiveness, HR should analyze the **external compensation competitiveness**, **internal fairness** and **compensation structure**. This report mainly focused on compensation internal fairness analysis and stock option analysis

✓ Current compensation initiative will reduce the attractiveness of promotion due **to unreasonable stock option plan** and "**pay down**" **problem**
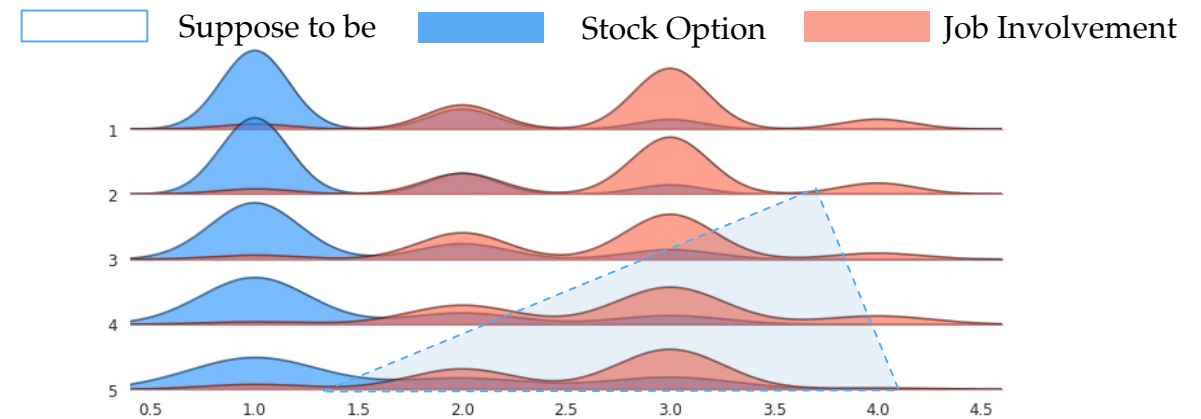
## **1** Income **Lack of** Internal Fairness

- • **"Pay Down"** occurs in each position, which means with job level increase, the medium value decreases
- • This will lead to the internal promotion lost attractiveness



Current Situation

Ideal Type

**Sales representative**
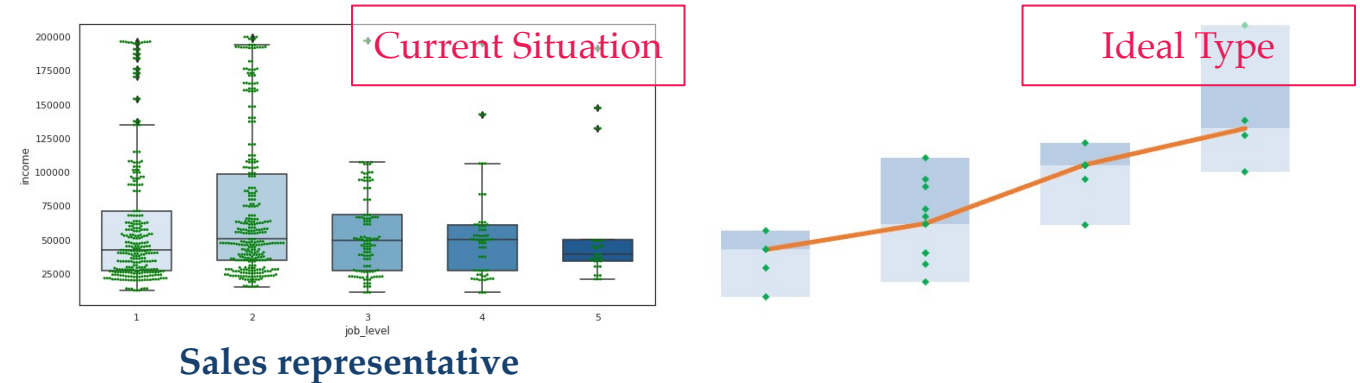
## **2** Stock Option **Lack of** Motivation Effectiveness

- • Stock Option is a powerful and distinguishable method to motivate **c-site**
- • Normally, executives should acquire **more or high-level stock option** compared to employees



Suppose to be | Stock Option | Job Involvement

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# Appendix: income diagnosis for each position



Healthcare Representative

Human Resources

Manufacturing Director

Research Scientist

Research Director

Sales Representative

Sales Executive

Laboratory Technician

Manager