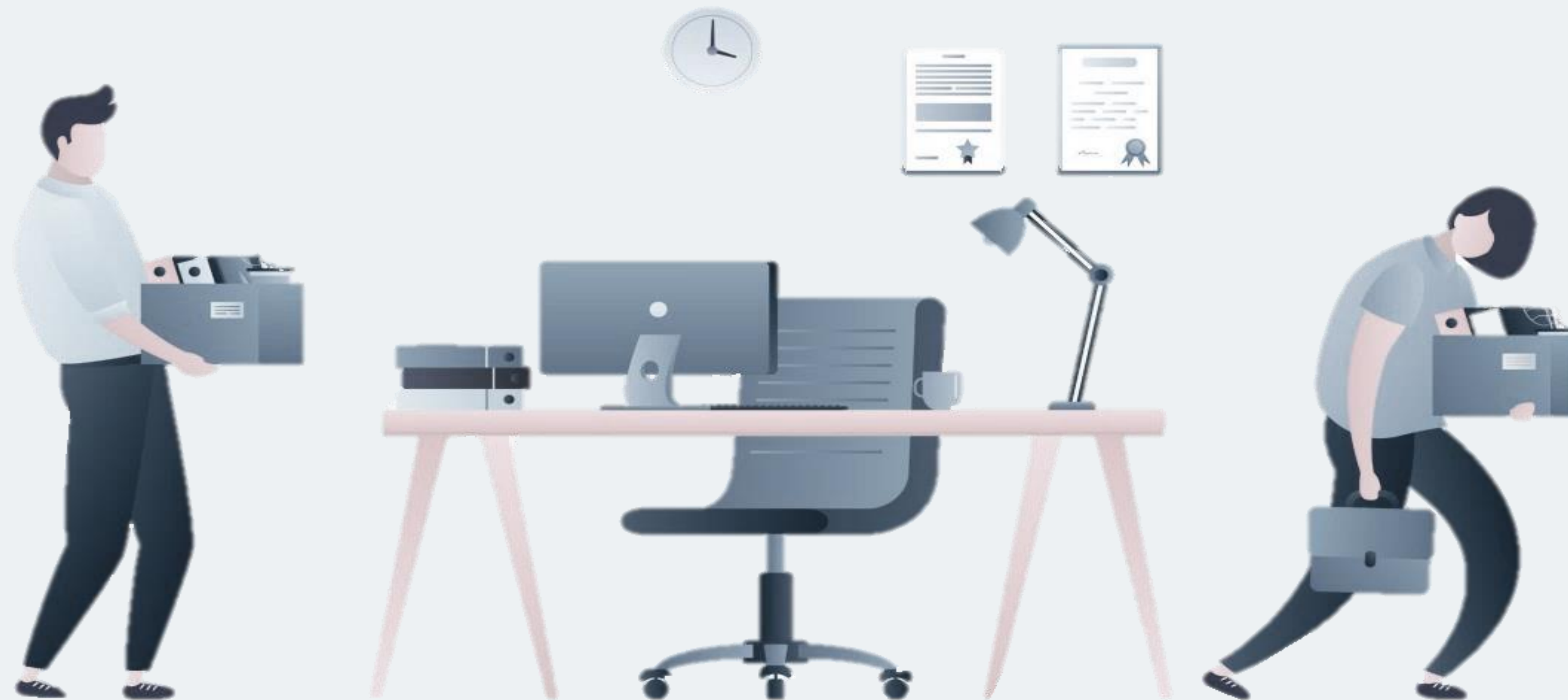


Curbing Employee Attrition

UNLOCKING INSIGHTS TO RETAIN TOP TALENT



Executive Summary (1/3)

Our company ranks higher than the world average on employee attrition, wasting resources with turnover

- The company ranks 3 pp above the world average. This translates in an estimated annual cost of 20.7 million euros in the substitution process, plus indirect costs like employee demoralization and client dissatisfaction.
- To predict attrition, suggest strategies to lower its rate and, consequently, save resources, our team created a model, it can identify which employees are about to leave, which are the contributing factors and what makes an employee keep working on the company.
- To characterize and understand the reasons of employees that are about to leave, we classified all employees in groups with three distinct profiles.

The predictive model can correctly identify 69% of employees in risk of leaving the company

- The factors contributing to *increased* attrition, in order of importance, include working overtime hours, frequent business travel, frequent company changes, lack of career progression, and having a long commute.
- The factors contributing to *decrease* attrition, in order of importance, include having a stable career (working for the company on the same role for longer), feeling involved on the job and be satisfied in the work, environment and relationship levels.

Executive Summary (2/3)

Current employees can be classified into three distinct groups, one of them in need of intervention

- *Where's the door?* group - Requires immediate measures. Consists of 219 employees, all of them leaving the company. High proportions of overtime and business traveling. Low job and environment satisfaction, low job involvement and live further away from the company.
- *Young go getters* group – No action required. Consists of 817 employees, none leaving the company. Opposite of the latter group in terms of attrition predictors.
- *Old but gold* group – Requires further investigation. Consists of 435 employees, only 19 (4%) leaving the company. Similar to the latter in terms of attrition predictors. Most of the elements with attrition are retirement cases but others are lagging in career progression.

We can take immediate measures to retain current employees and forward-looking measures to gather data to make better decisions in the future

- It's important to increase the frequency of training sessions to reduce overtime, since less trained employees are more likely to do extra hours. It's also important to gather more data to identify the causes and to know how many hours each worker is putting in, to tailor the solutions to the problems and improve the current model.

Executive Summary (3/3)

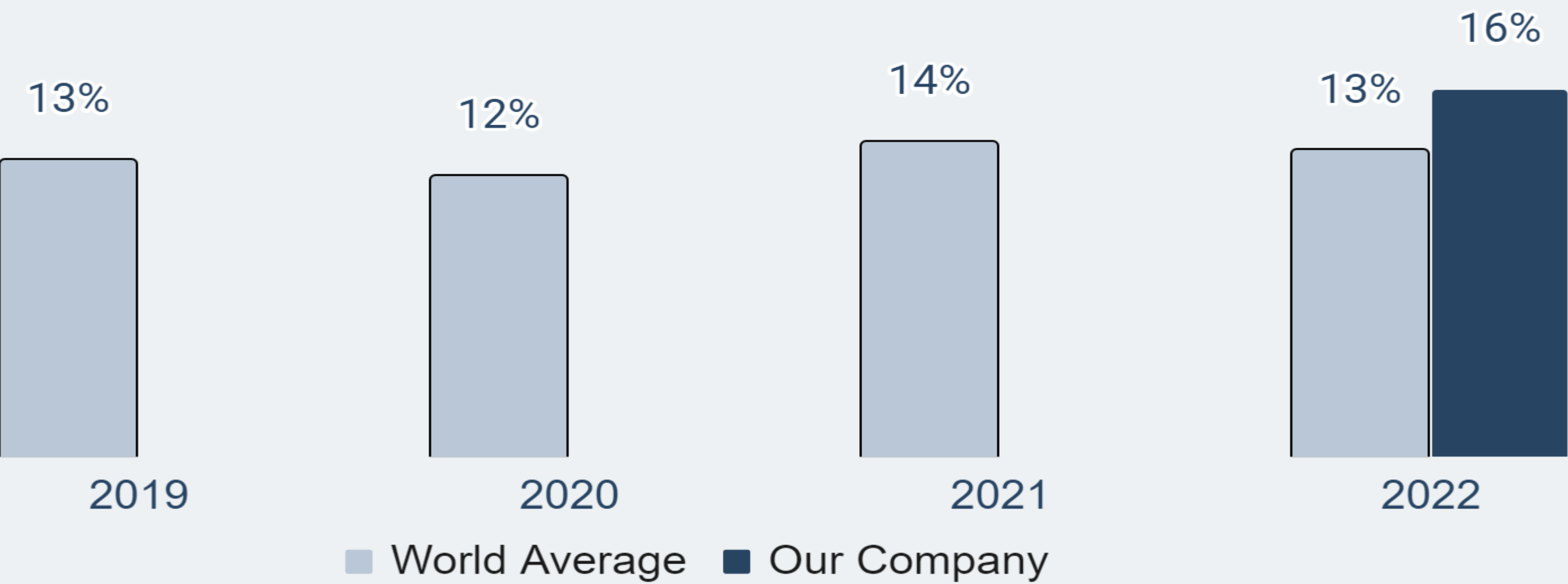
- We must reduce unnecessary business traveling, set travel policies to help offset its effects and increase employee rotation. Additionally, we need to gather more data to understand its frequency and if there are any notable thresholds.
- We need to improve employee performance evaluation and create personalized development plans to avoid career stagnation.
- To mitigate long commute effects, we can offer commuter benefits, like subsidizing a public transportation pass, promote remote work and flexible schedules.
- To avoid job hopping we can offer industry competitive compensation and benefits while providing opportunities for career and professional growth.

Work involvement, job, environment and relationship satisfaction offset effects of negative factors

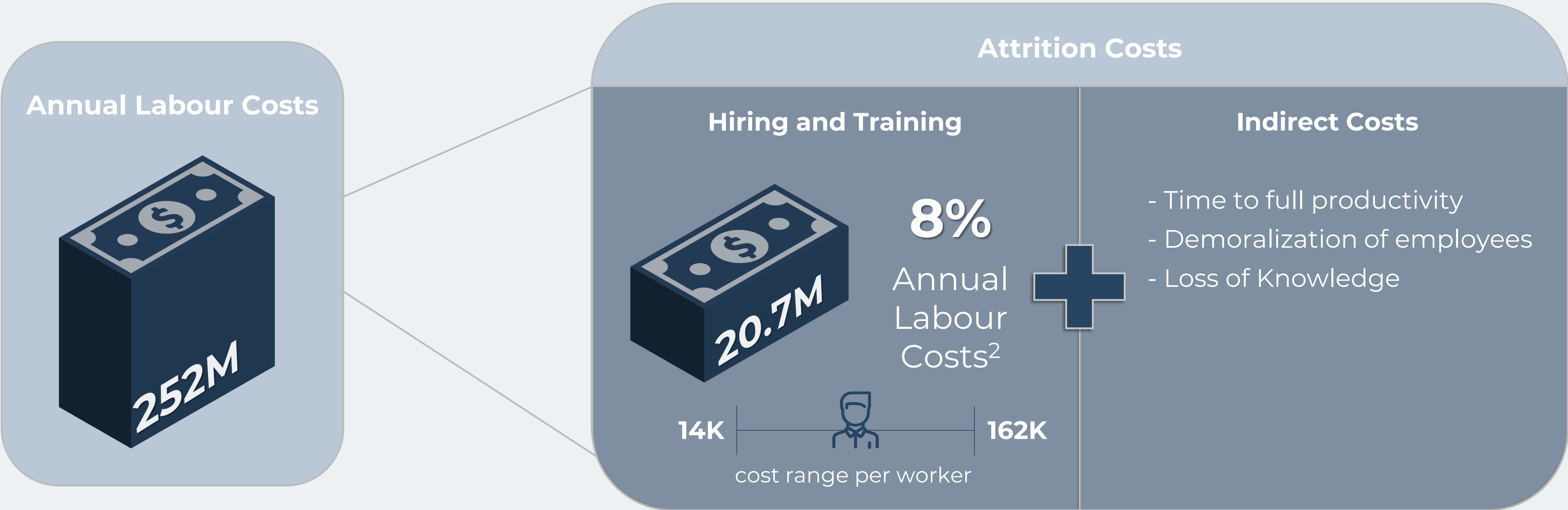
- Total working years and number of years in the current role are the paramount factors to keep attrition low, indicating that employees with stable careers have a lesser probability of leaving the company.
- Fostering job involvement, job, environment and relationship satisfaction are the key to create and maintain a company where employees wish to stay and develop their skills and careers.

8% of total annual labor budget spent with turnover

Employee attrition rate¹



Employee **attrition** is defined as the natural process by which employees **leave the workforce**. It can be **voluntarily** (resignation or retirement) or **involuntary** (termination).



1. Source: <https://www.statista.com/statistics/934377/professional-services-worldwide-employee-attrition-by-region/> (last data access at 10/10/23), 2. Ongori, H. (2007)

Project Goals : Predict Attrition, its determinant factors and employee subgroups profiling

How can we **lower** the **attrition** rate and **save money** on replacing employees?

Gathered a **dataset** with variables of interest

PREDICTIVE MODEL

- Identify **what variables** make an employee **stay** and **leave** the company
- **Predict** which **employees** potentially will **quit**
- Enables **preventive actions** to increase employee **retention**

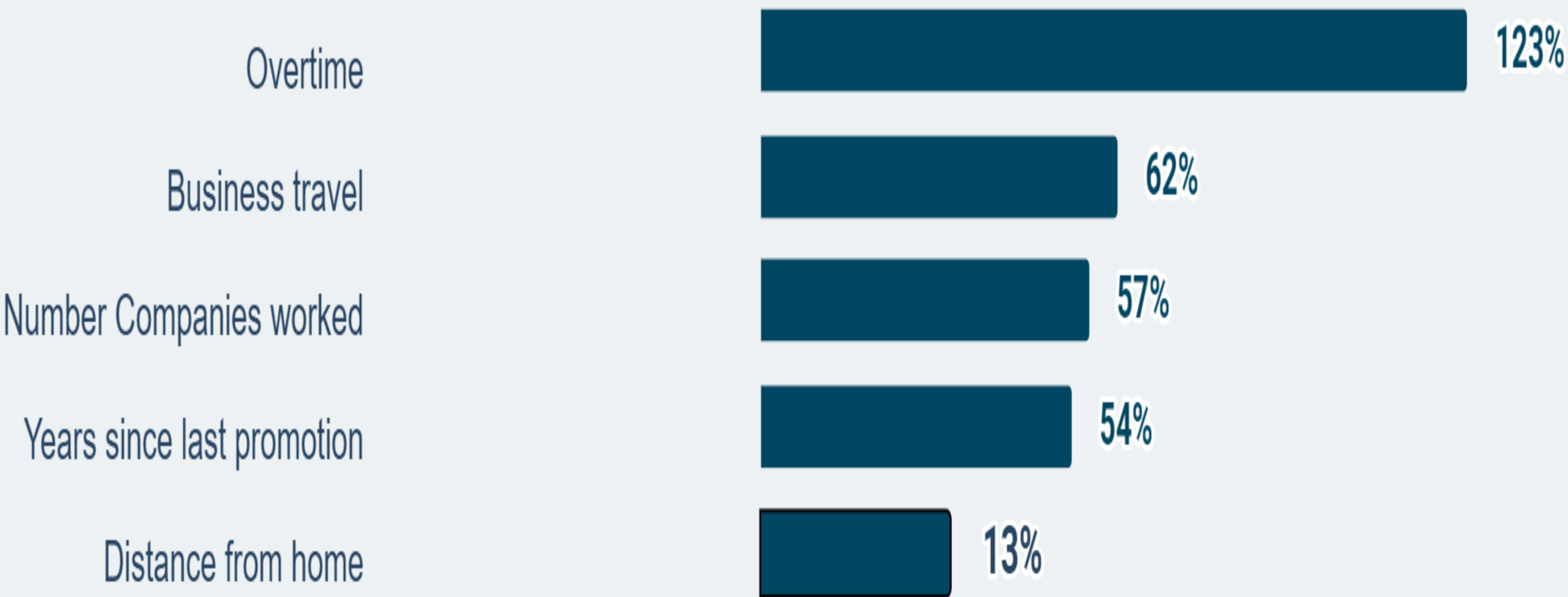
CLUSTERING: GROUP PROFILING

- **Characterize** each **employee** group
- **Distinguish** between normal causes of attrition (**retiring**) and factors that are making people **leave** and **seek better options**
- Enables addressing **current issues** in a **tailored fashion**

Our model can correctly identify 69% of employees with attrition



Predictive Model: Overtime has the largest impact on Attrition¹

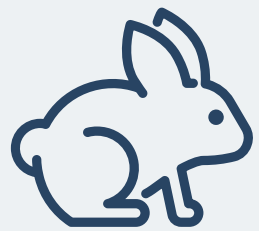


Top 4 variables that **increase the odds** of attrition



Overtime
123%

The employees who do **overtime** have **123%** more **odds**



Companies Worked
57%

An **increase** of **1 company** in **curriculum** is associated with a **57% increase**



Business Travel
62%

Going up from **1 level** of traveling frequency to the next is **associated** with a **62% increase**

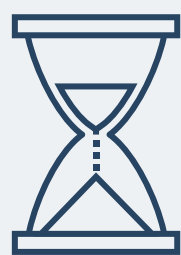


Years since last promotion
54%

An **increase** of **1 year** without being **promoted** is associated with a **54% increase**



Top 4 variables that **decrease the odds** of attrition



Total working years
-45%

An **increase** of **1 year** of work is associated with a **45% decrease**



Job involvement
-37%

Going up from **1 level** of involvement to the next is **associated** with a **37% decrease**



Years in current role
-45%

An **increase** of **1 year** in the **current role** is associated with a **45% decrease**



Environment satisfaction
-37%

Going up from **1 level** of satisfaction to the next is **associated** with a **37% decrease**

Additionally: An increase of 1 km in commuting is associated with a 13% increase; Going up from 1 level of job satisfaction to the next is associated with a 33% decrease; An increase of 1 year in employees age is associated with a 31% decrease; Going up from 1 level of relationship satisfaction to the next is associated with a 21% decrease.

1. When interpreting the effect of a specific variable, all others are held constant at zero.


Employee Group Classification: Cluster 1 in need of immediate measures



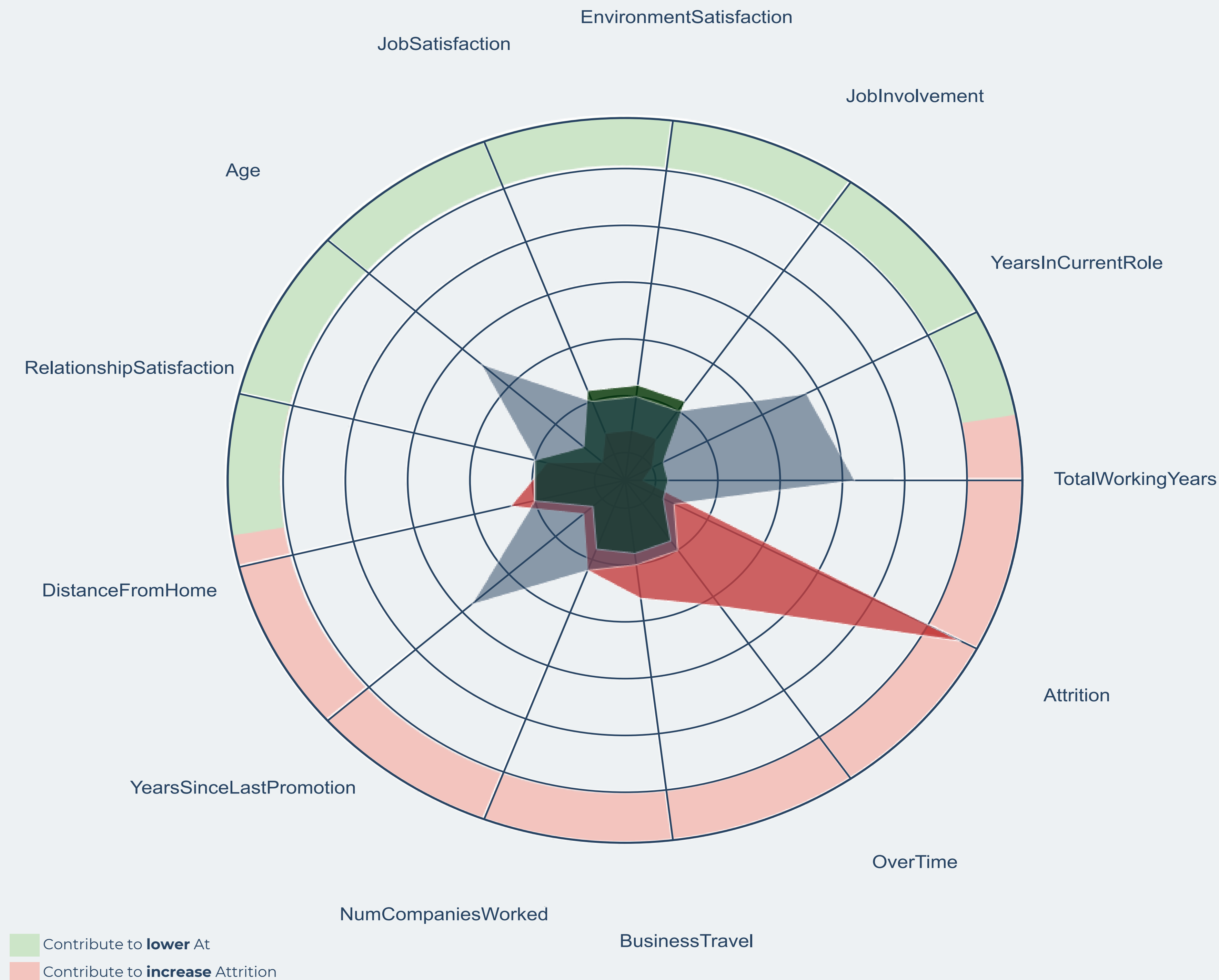
Where's the door?
219 employees
15% of total employees
100% Attrition within group
92% of company's attrition



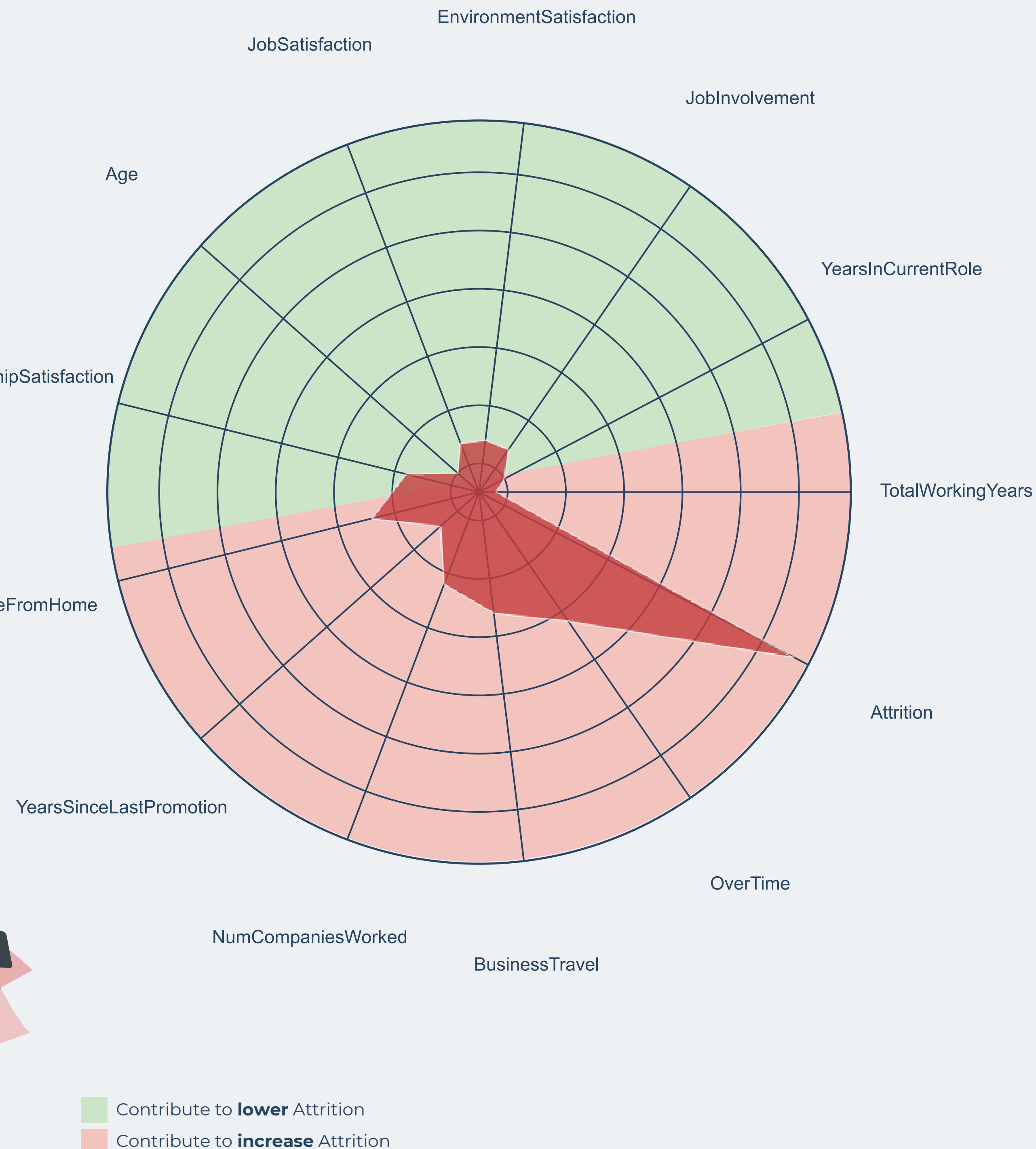
Young Go Getters
817 employees
56% of total employees
0% Attrition within group
0% of company's attrition



Old but Gold
435 employees
30% of total employees
4% Attrition within group
8% of company's attrition



“Where’s the door?”: Company’s Attrition core



- **All** elements are **leaving** the company.

- **Youngest** group (32 years on average). Most elements have **low-level jobs** (87% on level 1 and 2) with **low monthly income** (50% of employees make up to 2.967€).

- Fairly **new** in the **job market** (7 years on average), most recent **in the company** (4 years on average) and **brief occupation** of **current role** (2 years on average).

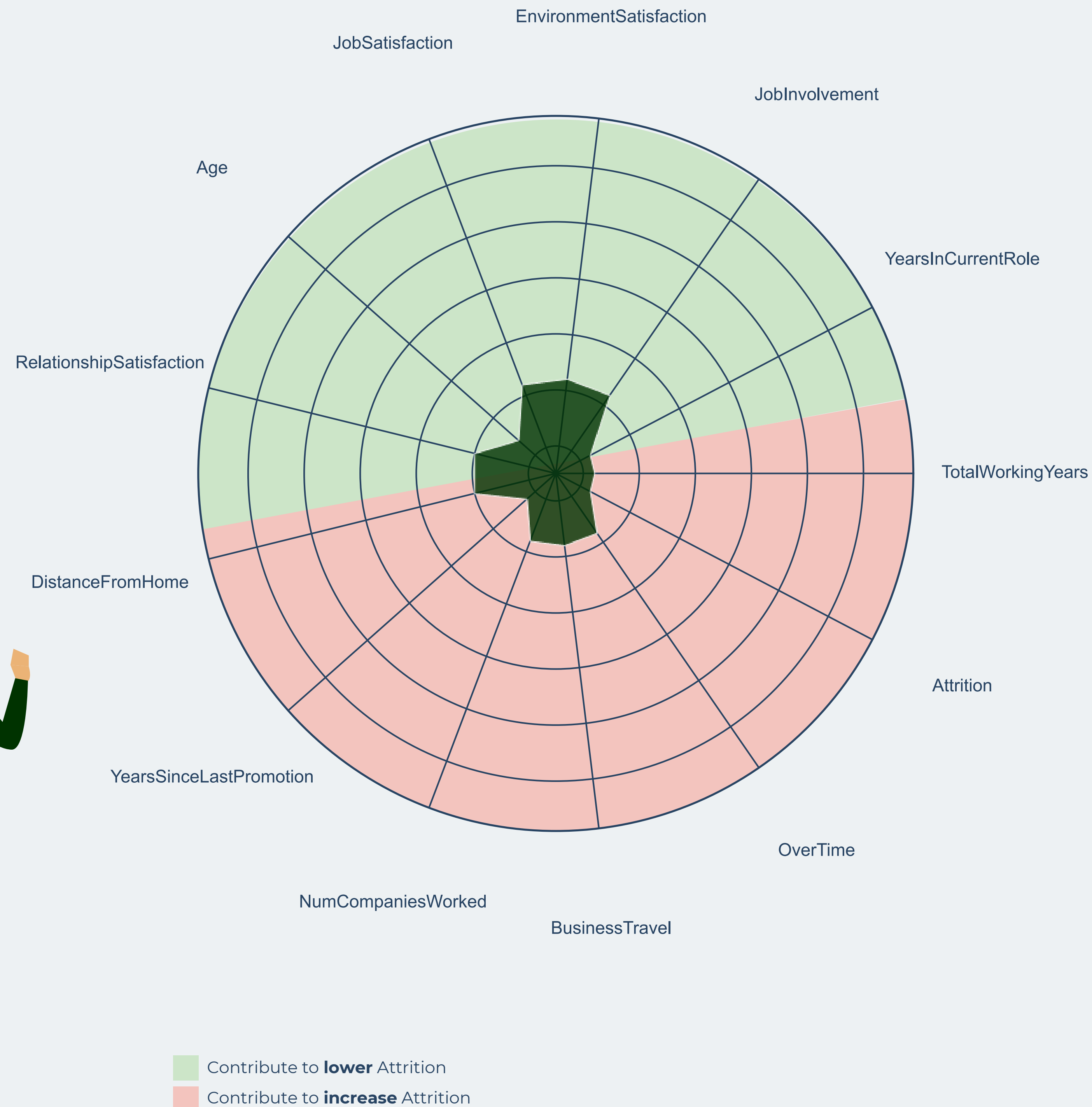
- **Lowest** environment **satisfaction**, job satisfaction and lowest job **involvement**.

- **Live further away** from the company (11 km on average).

- **Highest** proportion of **overtime** (56%).

- **Highest** proportion of **traveling** (30% frequently and 65% rarely).

“Young Go Getters”: An example to follow



- **None** of the elements are **leaving** the company.

- Similar age (34 years on average) and **low-level jobs** proportion (88% on level 1 and 2). **Higher monthly income**, comparatively (50% of employees make up to 4.284€).

- Equally **new** in the **job market** (8 years on average), **similar** time **in the company** (5 years on average) and **brief occupation** of **current role** (3 years on average).

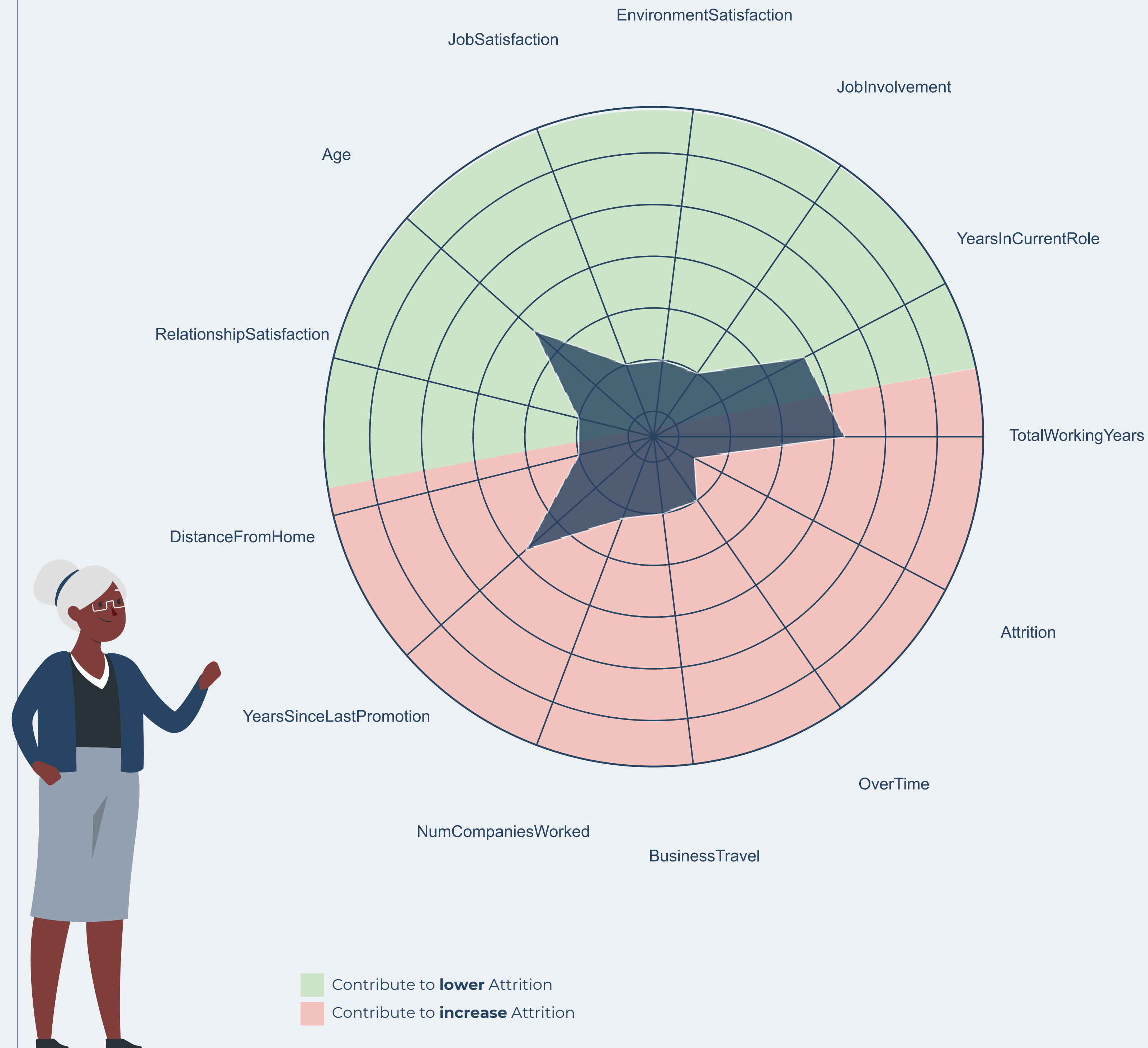
- **Highest** environment **satisfaction**, job satisfaction and highest job **involvement**.

- **Live closer** to the company (9 km on average).

- **Low** proportion of **overtime** (22%).

- **Low** proportion of **traveling** (16% frequently and 72% rarely).

“Old but Gold”: Value senior employees



- **4%** of the elements are **leaving** the company.

- **Oldest** group (44 years on average, higher concentration of employees between 50 and 60 years old). Many elements have **high-level jobs** (63% on level above 2) with **high monthly income** (50% of employees make up to 10.312€).

- **Seasoned** in the **job market** (20 years on average), **oldest in the company** (4 years on average) and **longest occupation of current role** (8 years on average).

- **High** environment **satisfaction**, job satisfaction and high job **involvement**.

- **Live close** to the company (9 km on average).

- **Low** proportion of **overtime** (27%).

- **Low** proportion of **traveling** (18% frequently and 71% rarely).

Decreasing Employee Turnover: Minimize overtime, business travel and career stagnation



Overtime



Business Travel



Years since last Promotion

Our Insights

- Proportion **increases** with **environment satisfaction**¹
- **Less trained employees** are **more likely** to work **extra hours**²

- Data **lacks detail**:
3 categories: Non, Frequently, Rarely

- **30%** of the **senior** group have stayed on **low level jobs** (below level 3) for **8 years** (on average) while **being with** the **company** for **11 years** (on average).
- Performance Ratings assume only 2 values

What can we do Now?

- **Increase** frequency of **training** sessions to improve efficiency
- **Set** an overtime **maximum limit**
- **Quantify** and **identify** the **sources**:
 - Get clock in data
 - Implement a time tracking solution

- **Reduce unnecessary** travel
- **Review** travel policies and **offer support** (travel reimbursement or time –off)
- Try to **increase** employee **rotation**

- Try to **understand** the **lack of career progression** with current **manager** (has been the same for the last 8 years)
- Create **personalized development plans**

What can be done in the Future?

- **Analyze** collected data:
 - **How many** extra **hours**?
 - Is overtime **task dependent**?
 - What are the **main causes**:
 - Excessive workload?
 - Inefficient processes?
 - Resource allocation issues?
 - Undertrained employees?
- Set courses of action to tackle identified problems
- **Improve** current predictive **model**

- **Quantify** and **describe**:
 - Get detailed data about **travel frequency**
 - Conduct a **survey** to understand how to make travel **more comfortable**
- **Analyze** collected data:
 - Is there a **threshold**?
 - Extract **insights** to **improve** current **travel policies**
- **Improve** current predictive **model**

- **Improve employee performance evaluation** methods to acknowledge and reward best performance, productivity and experience.
- Improve **transparent communication** of **promotion criteria**

1. p = 0.0419; 2. p= 0.0014

Decreasing Employee Turnover: Facilitate commuting and decrease job hopping



Distance from Home



Number of Companies Worked



Attrition

Our Insights

- Important factor to keep in mind while **recruiting** – it can serve as a **tiebreaker**

- Although having the similar number of companies worked, on average, the **“Where's the door?”** group **worked for each company for 2 years** and the **“Old but Gold”** group worked for **7** - suggesting a tendency to **job hopping**

What can we do Now?

- Offer **commuter benefits**:
 - Public transportation **monthly pass subsidies**
 - **Parking**
 - **Carpool** assistance
- Investigate the possibility of **Remote work**
- **Flexible schedules** implementation

- Offer industry **competitive compensation** and **benefits**
- Provide **career** and **professional development** opportunities

- Integrate the model in a **solution** that **signals** to the **HR** department, which **employees** are potentially **leaving**:
 - **Show** identified **variables**
 - Show **group** of employees and enable **comparison** to group average
 - Enables **elaboration** of **custom plan**
 - Show **projected cost** of quitting

What can be done in the Future?

- **Analyze** employee housing geographical distribution:
 - **Check** if a **shuttle service** from the major residential area to the workplace is **needed** and **viable**

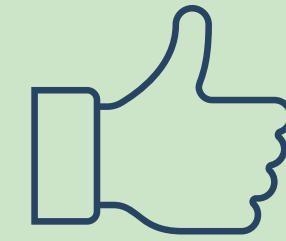
- **Implement exit interviews**:
 - Understand **motive**
 - Gather **feedback**
- **Gather more records** of employees who left to **improve model** training

Optimizing Employee Retention: Foster Job involvement, relationship, environment and job satisfaction to reduce attrition



Job Involvement

- **Involve** employees in **decision-making** processes when appropriate.
- Give **feedback** on work-related issues and **implement** constructive **suggestions**.
- **Keep** employees **informed** about company **goals, changes**, and **expectations**.



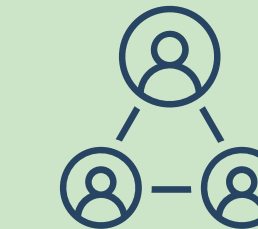
Job Satisfaction

- Provide opportunities for **skill development** and **career advancement**
- **Acknowledge** and **reward employees** for their hard work and achievements.
- Develop **policies** to enhance **work life balance**



Environment Satisfaction

- Promote a **positive** and **inclusive** workplace **culture**.
- Address and **resolve conflicts** promptly to maintain a harmonious environment.
- **Offer wellness programs** that focus on physical and mental health.



Relationship Satisfaction

- **Establish clear and open communication** channels between leadership, management and employees.
- Organize **team-building activities** and events to **strengthen** interpersonal **relationships** among employees



Total working years in the company and **years in the current role** are the most important factors to the reduction of attrition.

This indicates that employees with **stable careers** have a **smaller probability to leave** the company, as shown by the Senior group.

The **4 topics** discussed above are the **key** to create a company where employees want to **stay** and **develop** their skills and careers.

Annex

Bibliography

- Bacha, S. (2016). Antecedents and Consequences of Employee Attrition: A Review of Literature
- Das, B. L., & Baruah, M. (2013). Employee retention: A review of literature. Journal of business and management, 14(2), 8-16
- Ongori, H. (2007). A review of the literature on employee turnover;

Footnotes

- Slide 5: Calculations made on the assumption: “Research estimates indicate that hiring and training a replacement worker for a lost employee costs approximately 50 percent of the worker’s annual salary” - Ongori, H. (2007)
- Slide 8: Model confusion Matrix:

Logistic Regression - Validation Confusion Matrix

| | | |
|---|-----|--------------------------|
| 0 | 142 | 25 |
| 1 | 10 | 22 |
| | | Predicted |
| | | 0 1 |

Annex

- Slide 15: Chi-Square test and T-test outputs:

```
EnvironmentSatisfaction is IMPORTANT for predicting OverTime (chi2: 8.21, p-value: 0.0419).
```

```
Observed Frequencies:
```

| OverTime | No | Yes |
|-------------------------|-----|-----|
| EnvironmentSatisfaction | | |
| 1 | 222 | 62 |
| 2 | 206 | 81 |
| 3 | 320 | 133 |
| 4 | 306 | 140 |

```
Expected Frequencies:
```

| OverTime | No | Yes |
|-------------------------|--------|--------|
| EnvironmentSatisfaction | | |
| 1 | 203.63 | 80.37 |
| 2 | 205.78 | 81.22 |
| 3 | 324.80 | 128.20 |
| 4 | 319.79 | 126.21 |

```
TrainingTimesLastYear is IMPORTANT for predicting OverTime (t_statistic: -3.21, p-value: 0.0014).
```

```
OverTime
```

```
No    2.86
```

```
Yes   2.64
```


Take Home Message

- Our **goal** is to **reduce attrition** and **save costs** associated with turnover
- We created a **Predictive model** that identified **overtime** as the **main** factor contributing to attrition
- We identified **3 distinct groups** of employees with different characteristics – one where all the employees are **leaving the company**, one that is **flourishing** and other composed **by senior employees**, some leaving for **retirement**.
- We explored what measures can be taken based on our insights, short and long term. Some are **policies, benefits** that can be applied now to **reduce attrition**, others need **more research** to understand its causes and make data-based decisions.
- Additionally, we identified which factors contribute to **employee retention**, like **job involvement** and **satisfaction**.