



# HRTECH

Analyzed by -  
Shreya Meher & Tanya Das

# PROBLEM STATEMENT

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**#1**

Leverage external data/behavioral data to identify the 'right hire.'

**#2**

Provide solutions to lower attrition (e.g. predict an employee's resignation).

**#3**

Provide an expense management system for internal employees

# RIGHT HIRING

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# WHY EXTERNAL DATA/BEHAVIORAL DATA ANALYSIS IS IMPORTANT

## DEEPER CONSUMER INSIGHTS

Analyzing external data on market trends, competitor strategies, and customer demographics enables businesses to tailor products and services to evolving market needs. Additionally, leveraging behavioral data such as website clicks, purchase history, and app usage allows for targeted marketing campaigns, personalized recommendations, and improved customer journey optimization.

## ENHANCED RISK MANAGEMENT

Combining external data on fraudulent patterns with internal behavioral data enables the identification of suspicious transactions or activities. Similarly, leveraging external economic data helps anticipate market fluctuations, allowing companies to proactively mitigate risks and adapt to potential downturns.

## IMPROVED BUSINESS DECISION-MAKING

Market Research and Expansion involves using external data to inform decisions about market expansion and product development. Campaign Optimization analyzes marketing campaign performance to identify effective strategies and optimize budgets.

# PROPOSED SOLUTION



Planning the proper  
use of funds

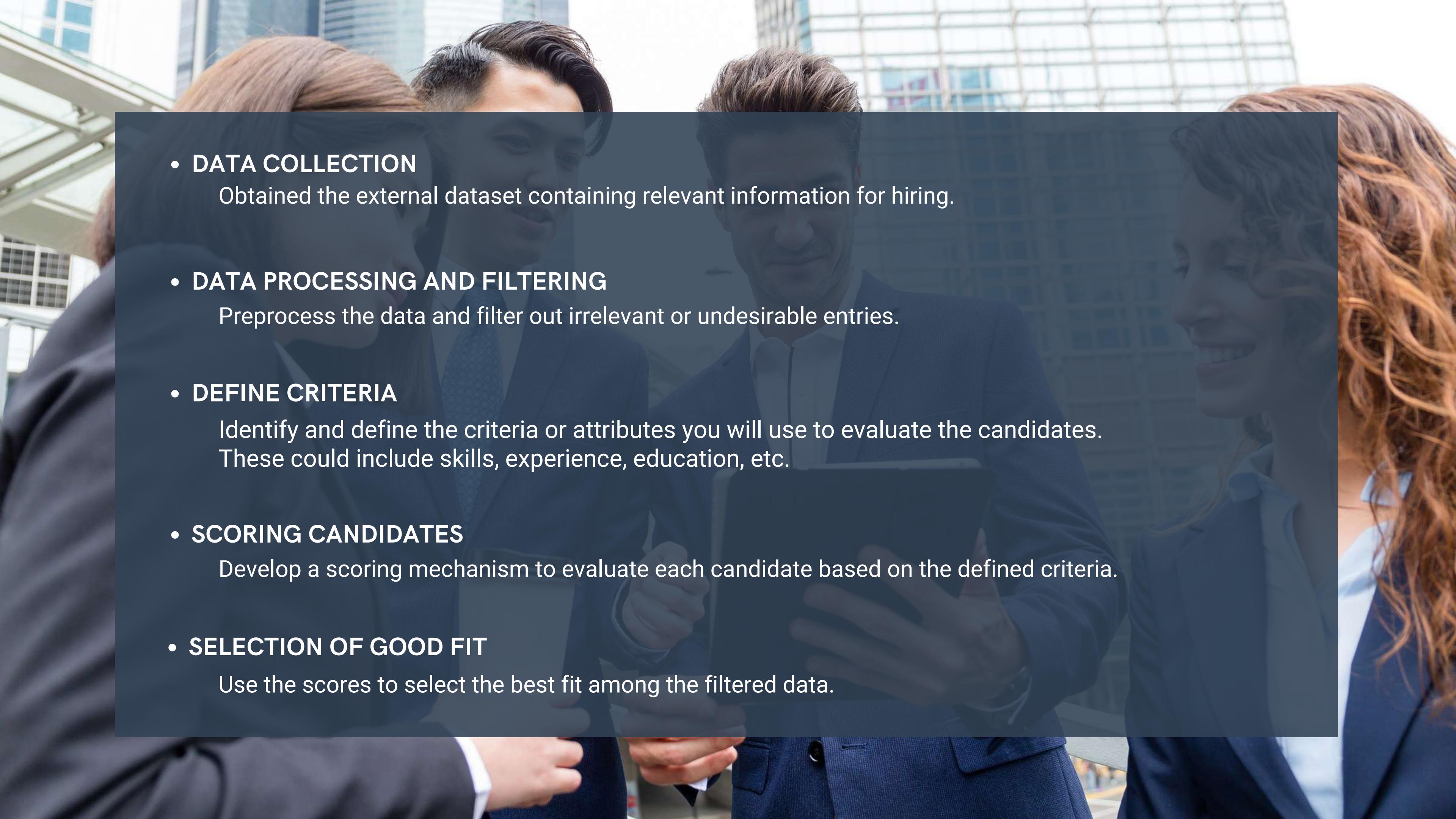
Finance is a term related to financial affairs. When it comes to financing,

- creating a right hiring model for recruiters is to establish a systematic and effective approach to identifying, attracting, and selecting the best candidates for job openings within an organization.
- This model aims to streamline the recruitment process, enhance the quality of hires, and ultimately contribute to the success of the organization.

# ABOUT DATA

- **Age:** age of the applicant, >35 years old or <35 years old (*categorical*)
- **EdLevel:** education level of the applicant (Undergraduate, Master, PhD...) (*categorical*)
- **Gender:** gender of the applicant, (Man, Woman, or NonBinary) (*categorical*)
- **MainBranch:** whether the applicant is a profesional developer (*categorical*)
- **YearsCode:** how long the applicant has been coding (*integer*)
- **YearsCodePro:** how long the applicant has been coding in a professional context, (*integer*)
- **PreviousSalary:** the applicant's previous job salary (*float*)
- **ComputerSkills:** number of computer skills known by the applicant (*integer*)
- **Employed:** target variable, whether the applicant has been hired (*categorical*)



A photograph of a diverse group of business professionals in a modern office environment. In the foreground, a man in a dark suit and tie is smiling warmly at the camera. Behind him, several other individuals are visible, including a woman with blonde hair, a man with dark hair, and another woman with long brown hair. They are all dressed in professional attire, such as suits and blouses. The background shows large windows looking out onto a city skyline with many skyscrapers under a clear sky.

- **DATA COLLECTION**

Obtained the external dataset containing relevant information for hiring.

- **DATA PROCESSING AND FILTERING**

Preprocess the data and filter out irrelevant or undesirable entries.

- **DEFINE CRITERIA**

Identify and define the criteria or attributes you will use to evaluate the candidates. These could include skills, experience, education, etc.

- **SCORING CANDIDATES**

Develop a scoring mechanism to evaluate each candidate based on the defined criteria.

- **SELECTION OF GOOD FIT**

Use the scores to select the best fit among the filtered data.

# STREAMLINING DATA: PYTHON TECHNIQUES FOR PROCESSING AND FILTERING

```
import re
from PyPDF2 import PdfReader
# Define the function to extract data from PDF
def get_data(filename):
    with open(filename, 'rb') as pdf_file:
        read_pdf = PdfReader(pdf_file)
        number_of_pages = len(read_pdf.pages)
        page = read_pdf.pages[8]
        page_content = page.extract_text()
        print(page_content.encode('utf-8'))

# Example regular expression matching
prog = re.compile("\s*(Name|name|nick).")
result = prog.match("Name: Shreya Meher")

if result:
    print(result.group(0))
```

```
# Example regular expression matching
prog = re.compile("\s*(Name|name|nick).")
result = prog.match("Name: Shreya Meher")

if result:
    print(result.group(0))

# List of filenames
files_list = ['/content/shreya_meher_resume.pdf']

# Iterate over the list and call get_data function
for filename in files_list:
    get_data(filename)
```

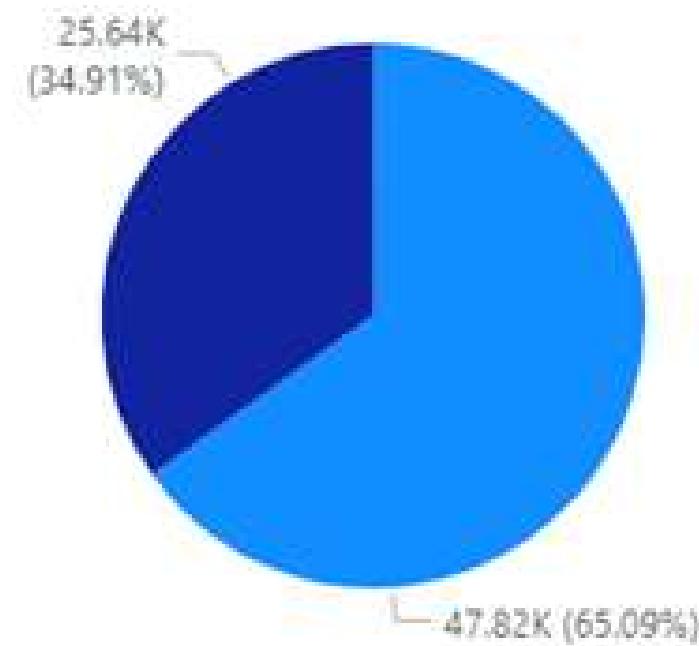
# MAXIMIZING ORGANIZATIONAL SUCCESS: INTERPRETATION

The interpretation suggests that while meeting the criteria set by HR recruiters and being the best fit for the company are essential qualities in a candidate, behavioral traits such as honesty and loyalty play a crucial role in long-term retention and reducing attrition rates. Therefore, the best fit or right hire is not only someone who fulfills the job requirements and aligns with the company culture but also demonstrates honesty and loyalty, indicating a commitment to staying with the company for an extended period. This holistic approach ensures that the chosen candidate not only excels in their role but also contributes to a stable and loyal workforce, ultimately benefiting the organization's success and minimizing turnover costs.



# ANALYSIS OF EXTERNAL/BEHAVOUR DATA

Count of Gender by Age



9.10

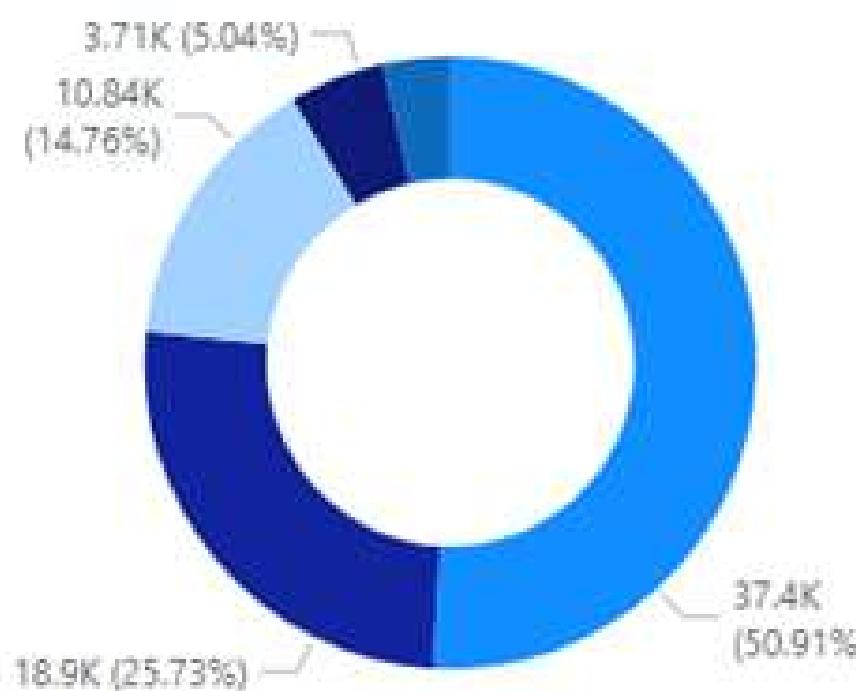
Average of YearsCodePro

Age  
● <35  
● >35

14.22

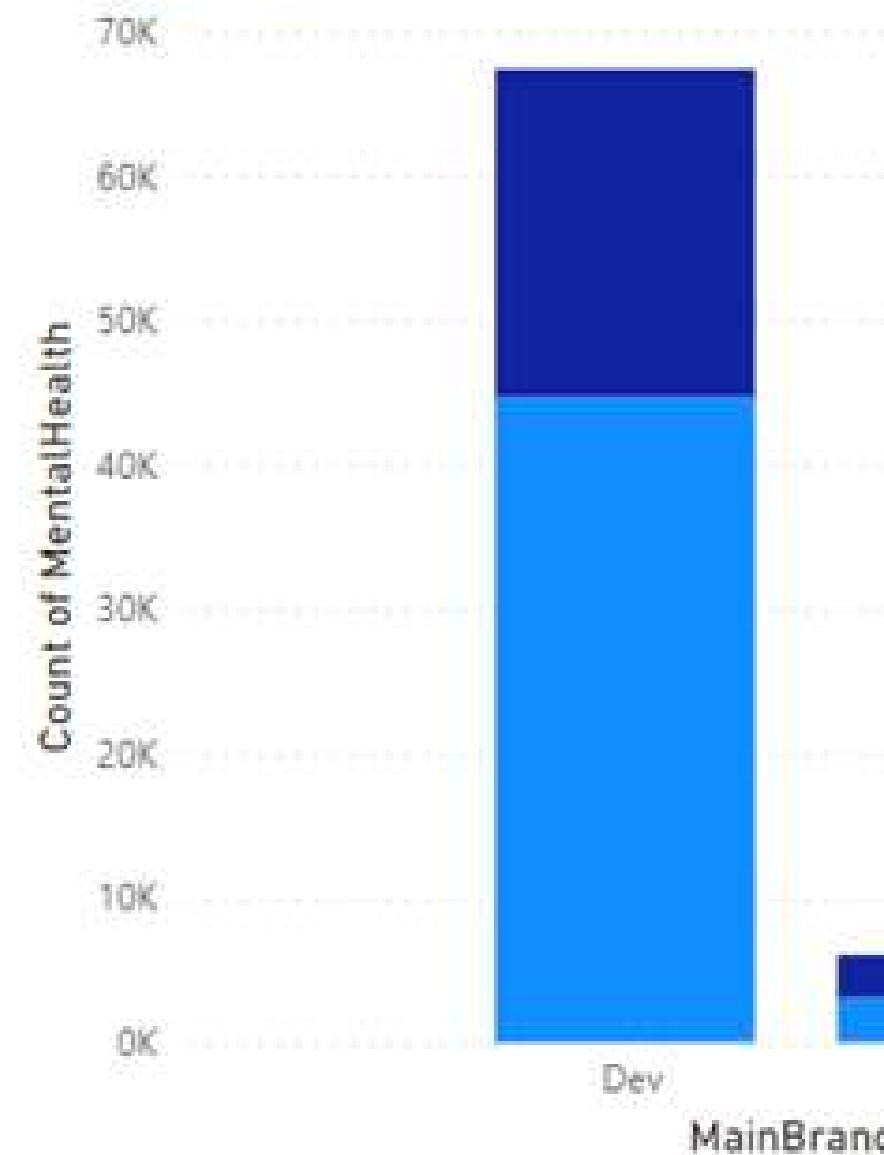
Average of YearsCode

Count of Accessibility by EdLevel



Count of MentalHealth by MainBranch and Age

Age ● <35 ● >35



>35 Country

<35 Afghanistan

>35 Afghanistan

<35 Albania

>35 Albania

<35 Algeria

>35 Andorra

<35 Angola

>35 Angola

<35 Argentina

>35 Argentina

<35 Armenia

>35 Armenia

<35 Australia

>35 Australia

<35 Austria

>35 Austria

<35 Azerbaijan

>35 Azerbaijan

<35 Bahrain

>35 Bahrain

<35 Bangladesh

>35 Bangladesh

<35 Barbados

>35 Barbados

<35 Belarus

>35 Belarus

# BUILDING A BETTER SOCIETY: THE IMPACT OF PRIORITIZING DEDICATION AND LONG-TERM COMMITMENT IN HIRING PRACTICES

- 1. Professional Excellence and Innovation:** Hiring dedicated individuals fosters a culture of innovation. They bring fresh perspectives, creativity, and proactive problem-solving, driving advancements in their fields.
- 2. Knowledge Sharing and Skill Development:** Passionate employees engage in continuous learning, benefiting both the organization and society by expanding the pool of skilled professionals.
- 3. Stability and Growth:** Long-term commitment leads to stability and growth. A loyal workforce fosters resilience and adaptability, contributing to organizational success and competitiveness.
- 4. Social Impact and Community Engagement:** Committed employees drive social impact initiatives and community outreach. This addresses societal challenges, supports local communities, and promotes social cohesion.
- 5. Inspiring Future Generations:** Prioritizing dedication inspires future professionals. It fosters purpose-driven work and a sense of contribution to society among aspiring individuals.

# HR ATTRITION



# PROPOSED SOLUTION



## DATA COLLECTION

Obtained the external dataset containing relevant information for attrition



## DATA PROCESSING AND FILTERING

Preprocess the data and filter out irrelevant or undesirable entries.



## DATA VISUALIZATION

Analyzing the relationship between factors to better understand attrition trends.



## INTERPRETATING REASON'S

Interpreting reasons means analyzing underlying causes or motivations behind actions or outcomes.



## FINDING SOLUTIONS

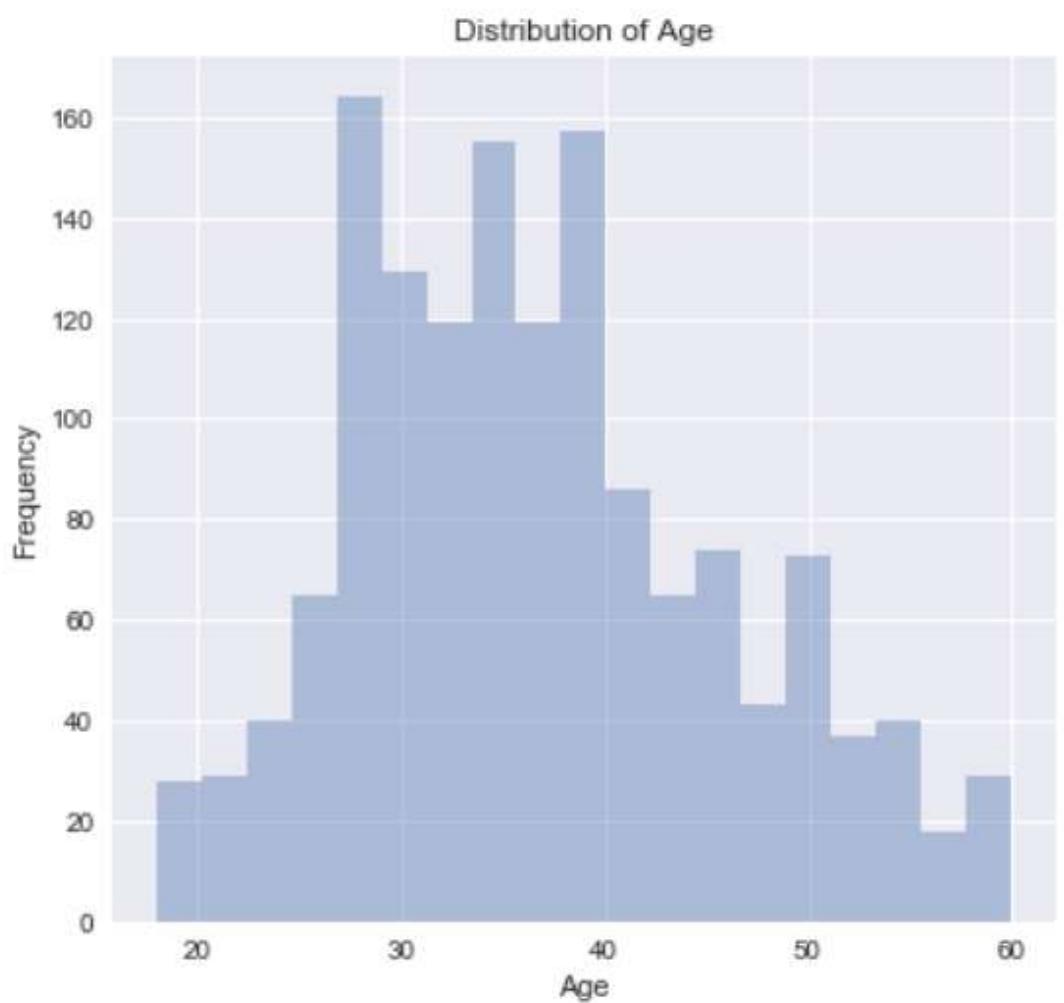
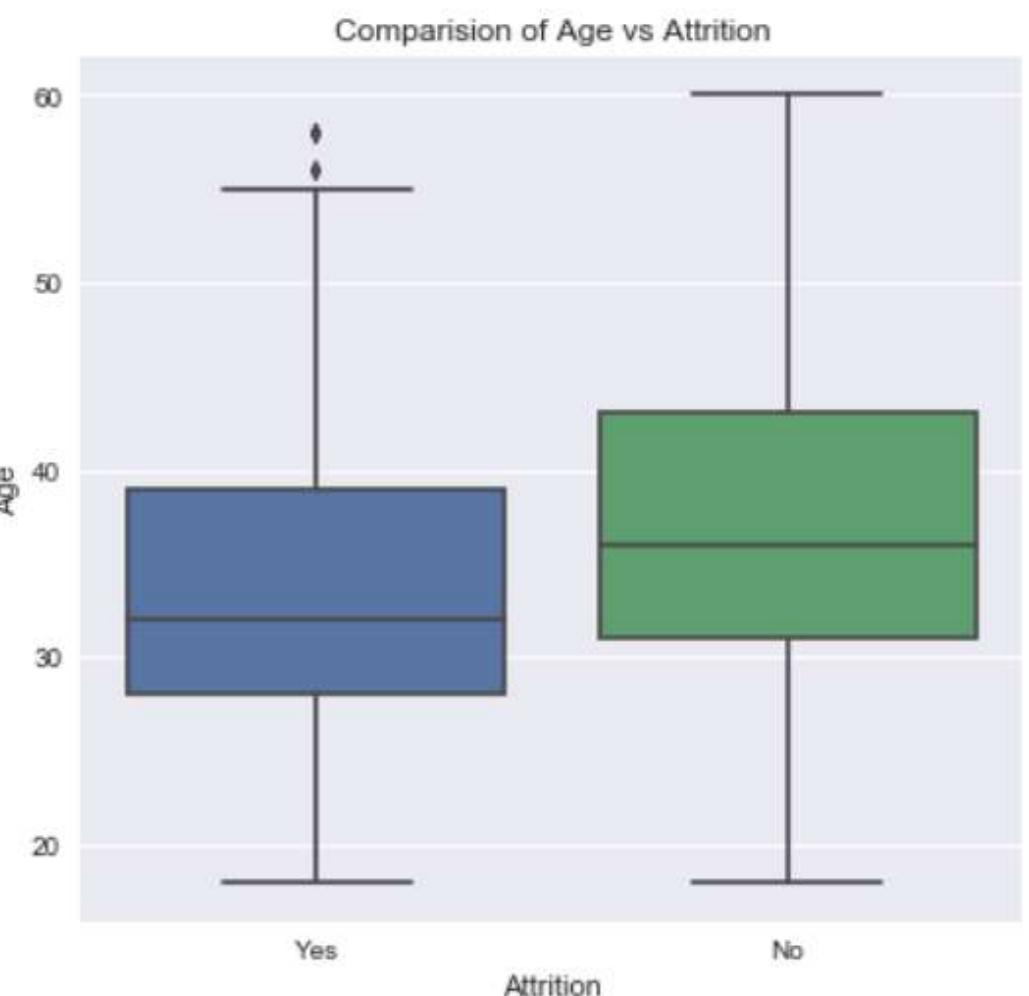
# ABOUT DATA

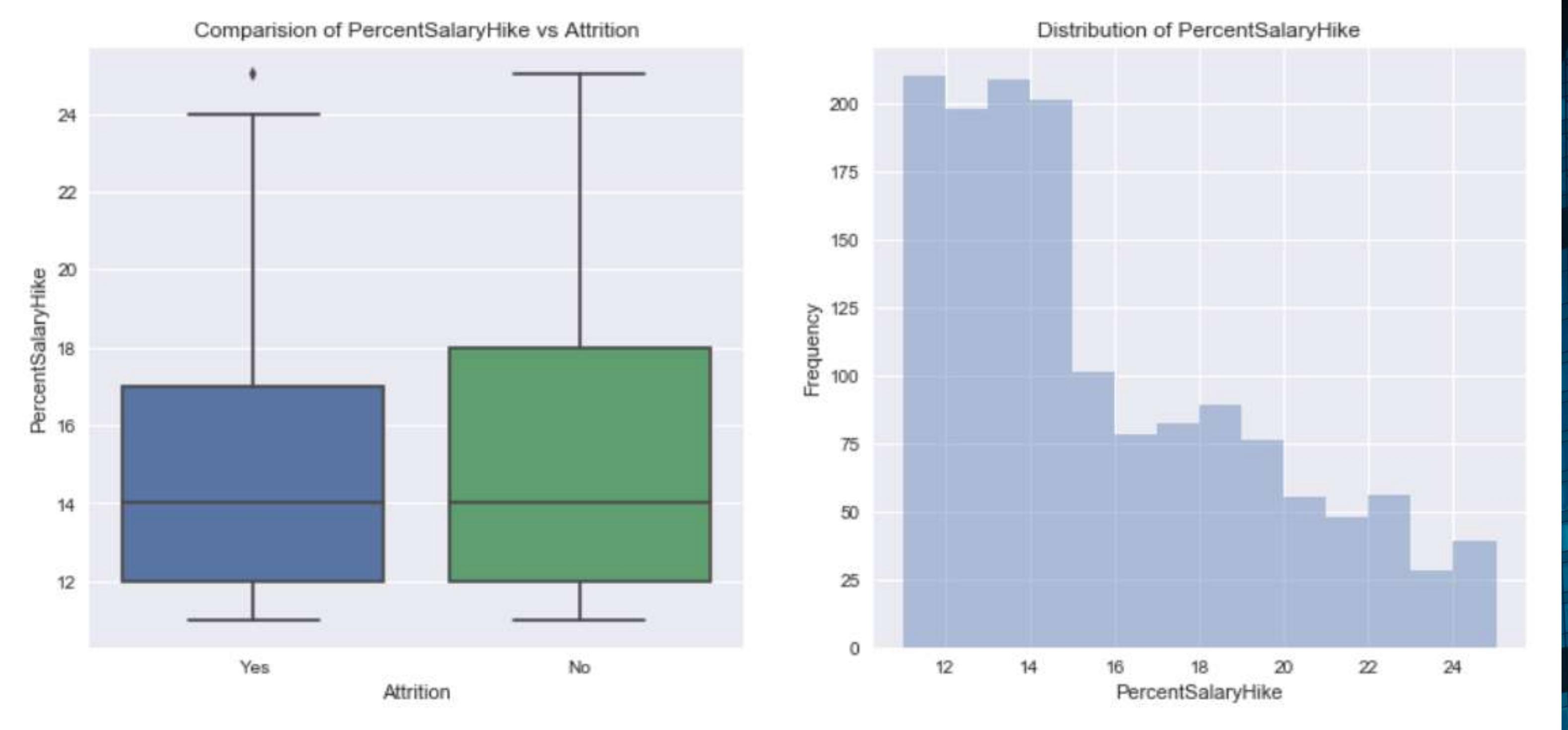
1. Age: Employee's age.
2. Attrition: Employee turnover rate.
3. DailyRate: Daily wage/salary.
4. JobRole: Employee's position.
5. MonthlyIncome: Monthly earnings.
6. Overtime: Overtime work indicator.
7. PerformanceRating: Employee's performance rating.
8. YearsAtCompany: Years with the company.



# STREAMLINING DATA: PYTHON TECHNIQUES FOR PROCESSING AND FILTERING

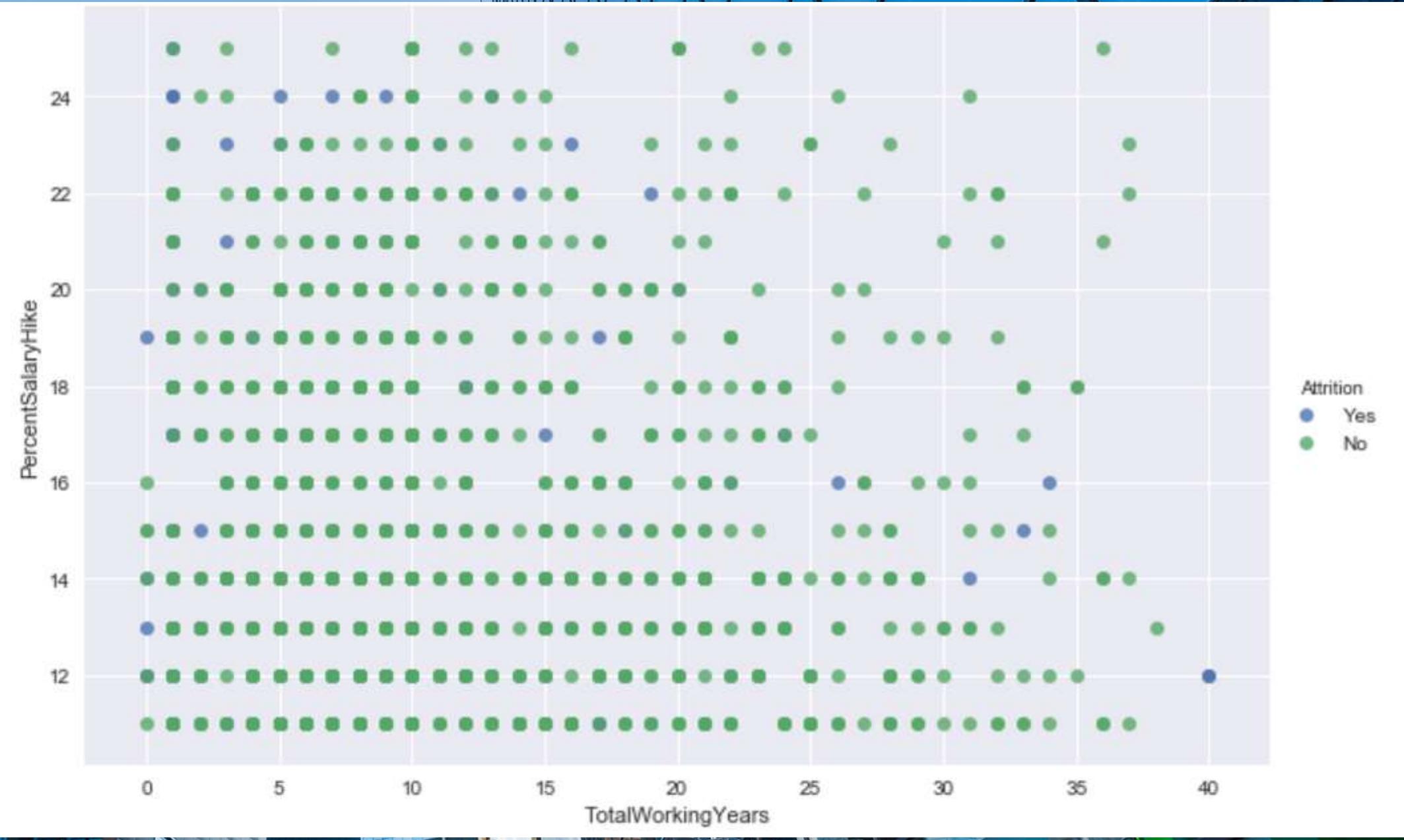
- We found that median age of employee's in the company is 30 - 40 Yrs. Minimum age is 18 Yrs and Maximum age is 60 Yrs.
- From the Age Comparision boxplot, majority of people who left the company are below 40 Yrs and among the people who didn't left the company are of age 32 to 40 years



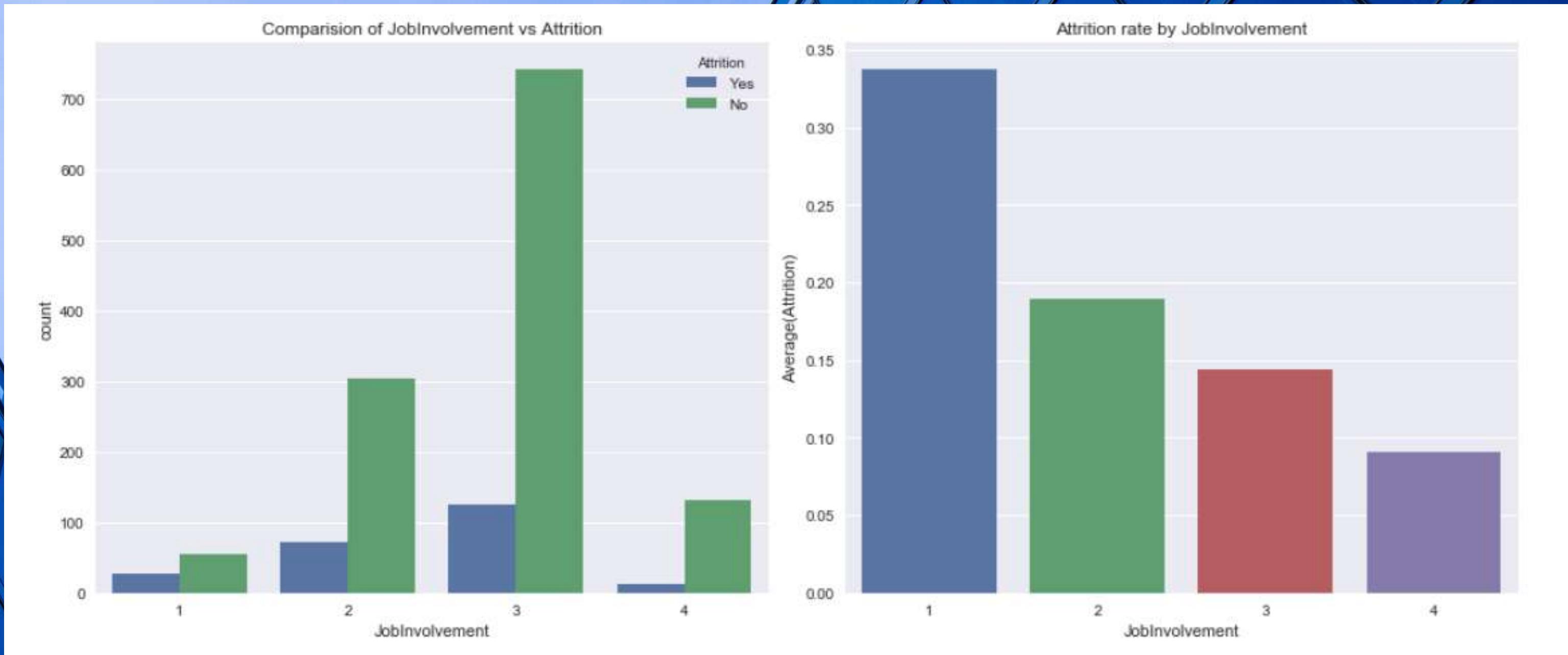


- Majority (60% of total strength) of employee's receive 16% salary hike in the company, employee's who received less salary hike have left the company.

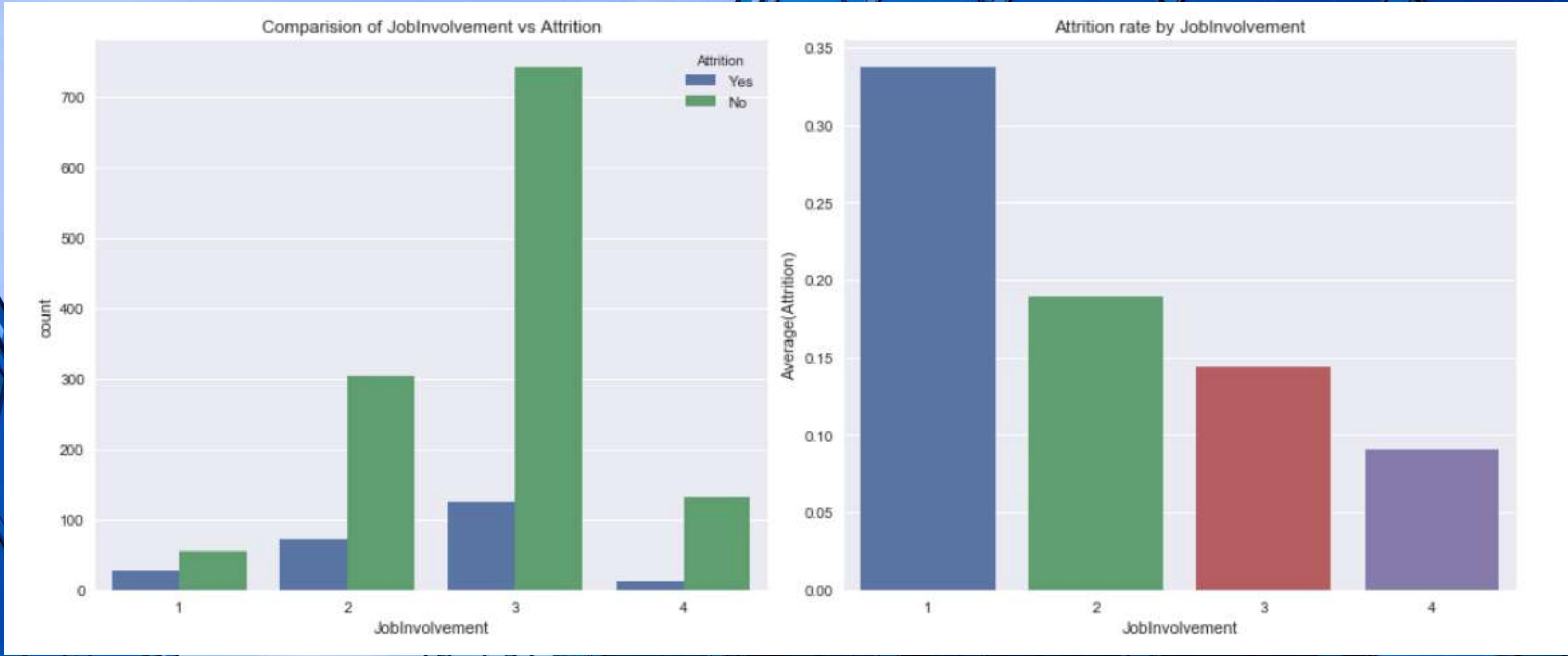
- Employee's with less working years have received 25% Salary hike when they switch to another company, but there is no linear relationship between working years and salary hike.



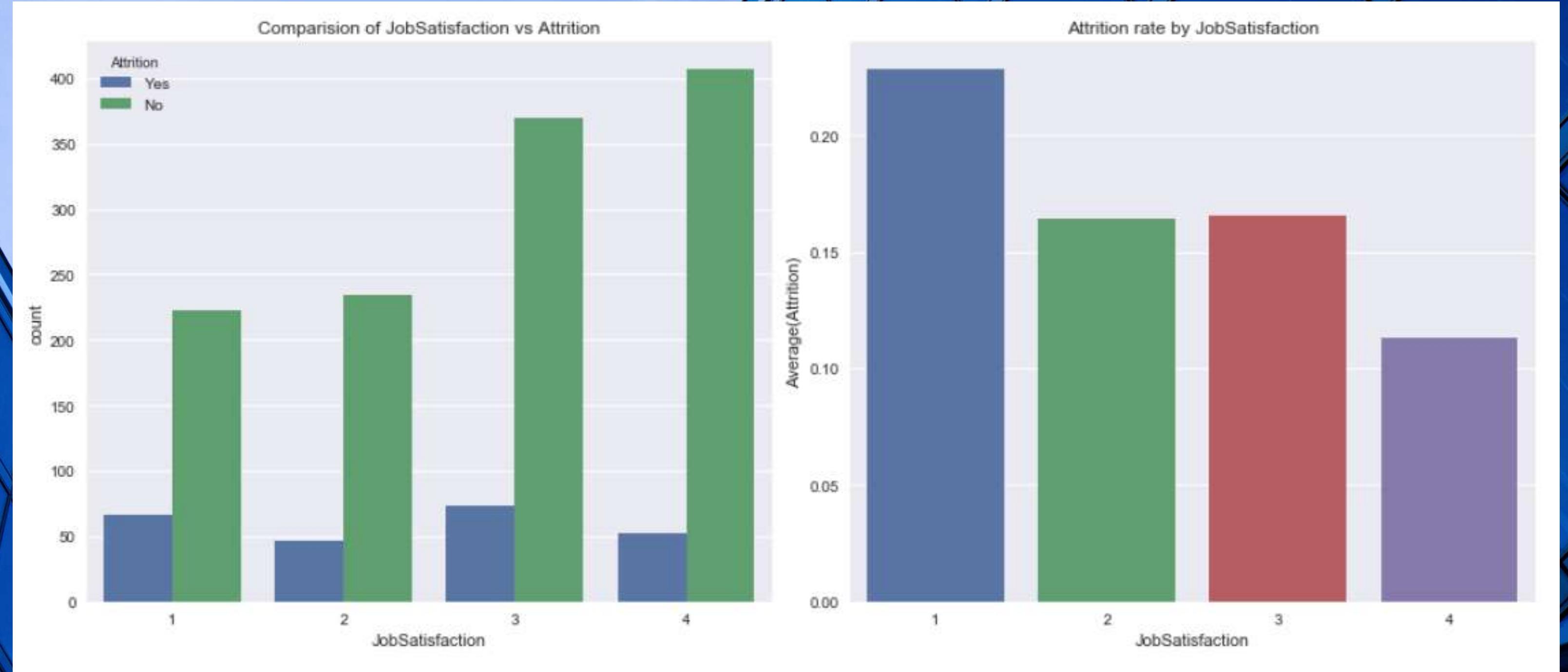
- Attrition is not seen among the employee's having more than 20 years of experience if their salary hike is more than 20%, even if the salary hike is below 20% attrition rate among the employee's is very low.
- Employee's with lesser years of experience are prone to leave the company in search of better pay, irrespective of salary hike



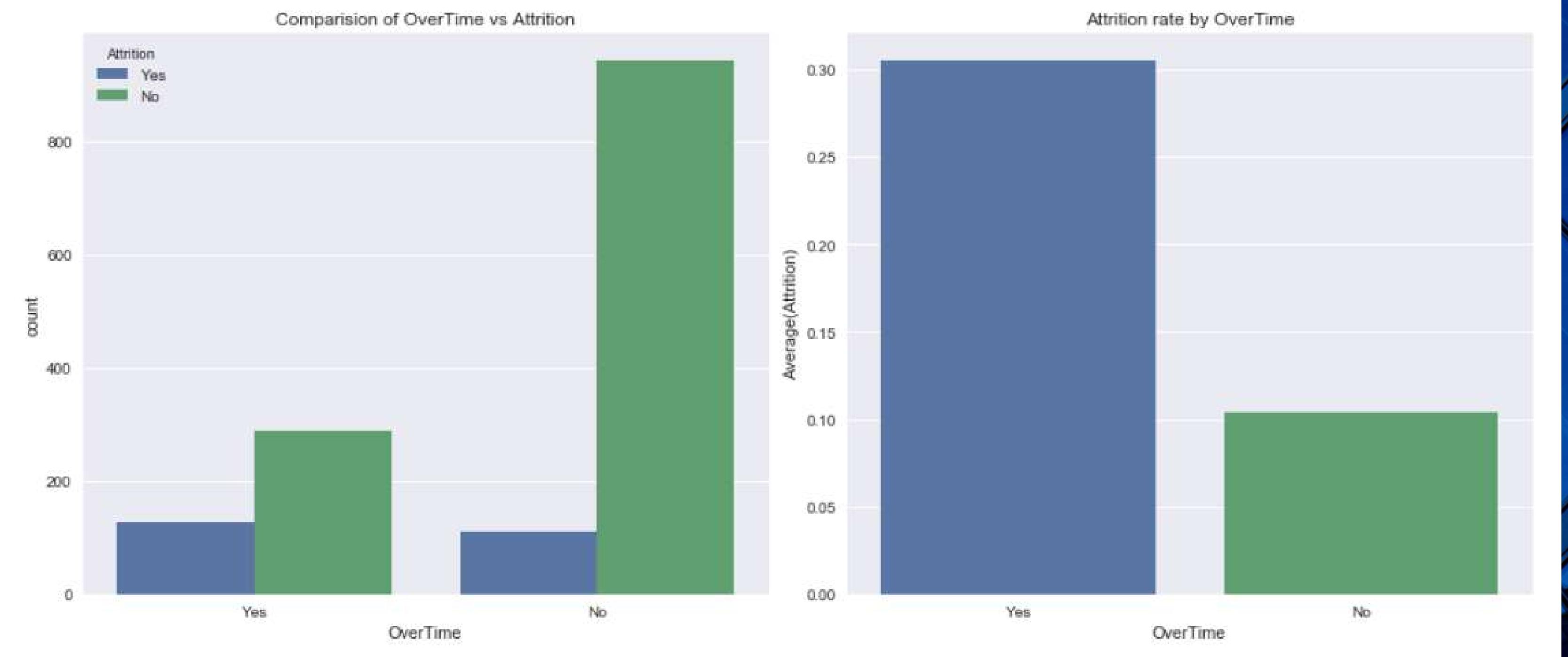
- In the total data set, 59% have high job involvement whereas 25% have medium involvement rate
- From above plot we can observe that round 50% of people in low job involvement (level 1 & 2) have left the company.
- Even the people who have high job involvement have higher attrition rate around 15% in that category have left company



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- Even the people who have high job involvement have higher attrition rate around 15% in that category have left company



- As expected, people with low satisfaction have left the company around 23% in that category. What surprising is out of the people who rated medium and high job satisfaction around 32% has left the company. There should be some other factor which triggers their exit from the company



**More than 30% of employee's who worked overtime has left the company, where as 90% of employee's who have not experienced overtime has not left the company. Therefore overtime is a strong indicator of attrition.**



# PREDICTIVE SOLUTIONS FOR EMPLOYEE RETENTION

Interpreting the solution to lower attrition involves implementing strategies to predict employee resignation. This could entail leveraging data analytics and machine learning algorithms to identify patterns and factors that precede voluntary departures. By accurately predicting resignations, organizations can proactively intervene with targeted retention initiatives, such as personalized career development plans, enhanced benefits, or improved work-life balance, to mitigate attrition and foster employee retention.



# HR ANALYTICS DASHBOARD

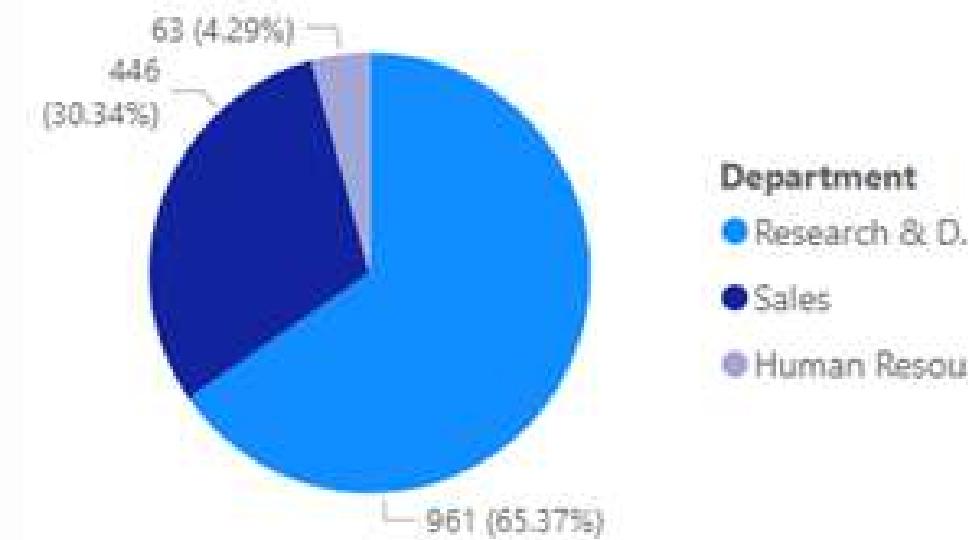
## Attrition



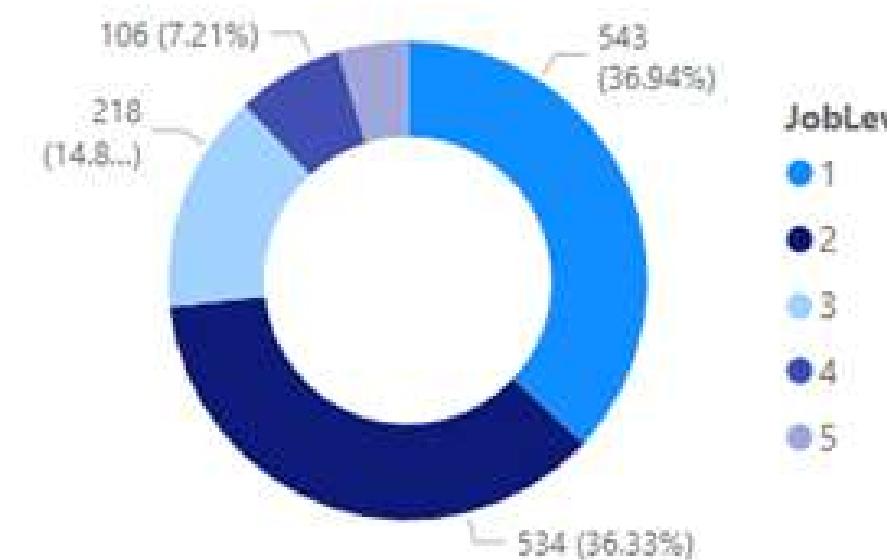
1470

Sum of EmployeeCount

## Count of Attrition by Department



## Count of JobRole by JobLevel

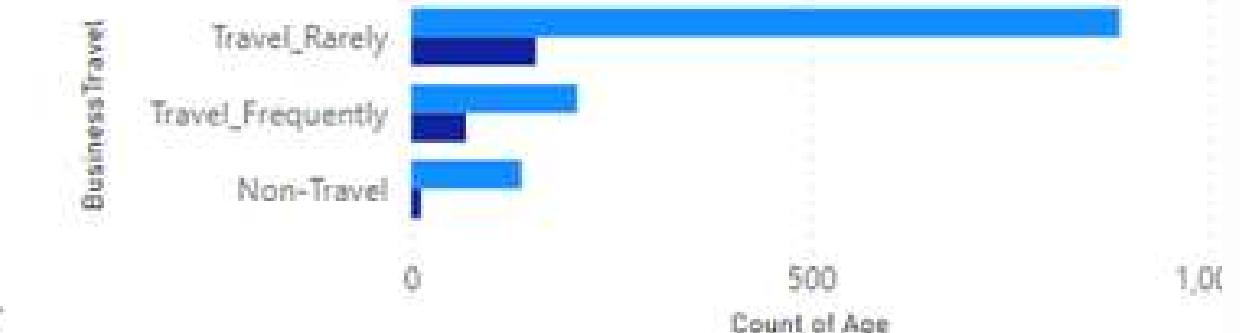


## Sum of EmployeeNumber by EnvironmentSatisfaction

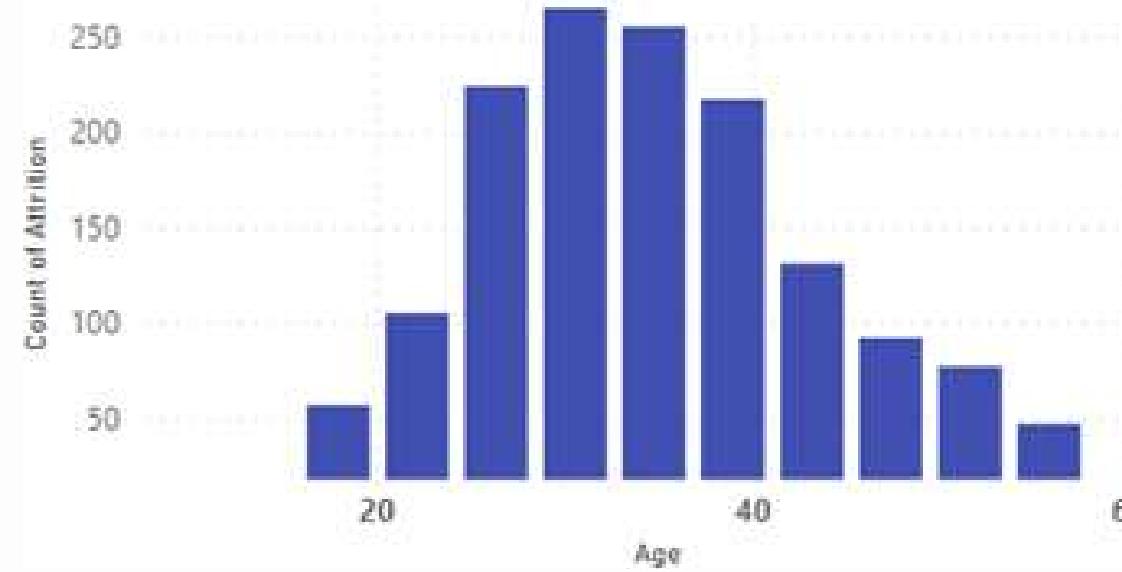


## Count of Age by BusinessTravel and Attrition

Attrition    ● No    ● Yes

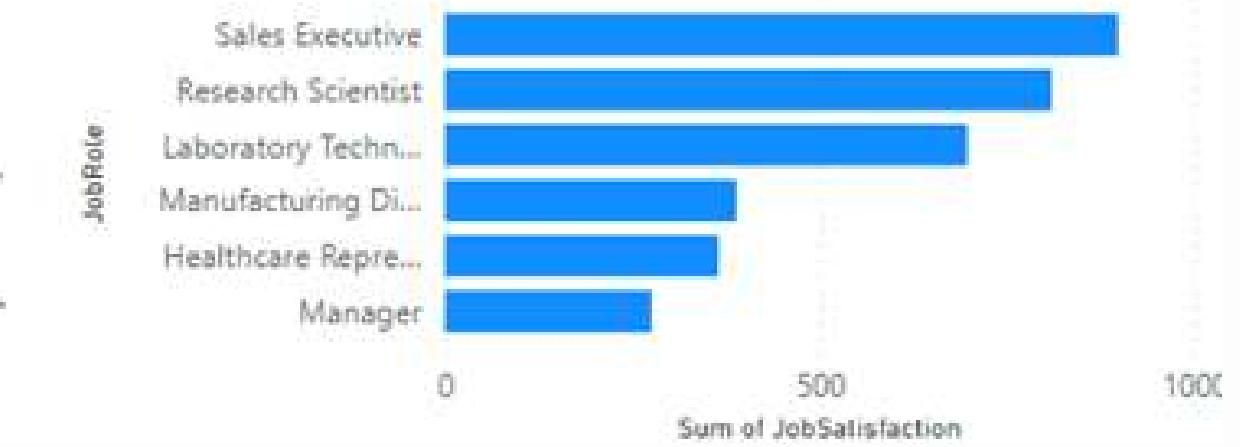


## Count of Attrition by Age



	No	Yes
Average of YearsAtCompany	7.37	5.13
Average of YearsWithCurrentManager	4.37	2.85
Average of YearsSinceLastPromotion	2.23	1.95
Average of TotalWorkExperience	11.86	8.24

## Sum of JobSatisfaction by JobRole



Unlocking insights from HR data is pivotal for informed decision-making in today's dynamic workplaces. And Power BI provides the perfect platform to transform raw data into actionable insights.

# FOSTERING SOCIETAL WELL-BEING: THE IMPACT OF PREDICTIVE STRATEGIES ON EMPLOYEE RETENTION

**Economic Stability:** Reduced employee turnover leads to lower recruitment and training costs for businesses, contributing to economic stability by conserving resources and reducing unemployment rates.

**Job Security:** Predicting and preventing employee resignations ensures greater job security for workers, promoting financial stability and well-being for individuals and their families.

**Social Cohesion:** Stable employment fosters social cohesion by providing individuals with a sense of belonging and stability within their communities, reducing social unrest and enhancing overall societal harmony.

**Career Development:** Implementing personalized retention initiatives, such as career development plans, benefits all employees by offering opportunities for growth and advancement, thereby enhancing professional skills and employability across society.

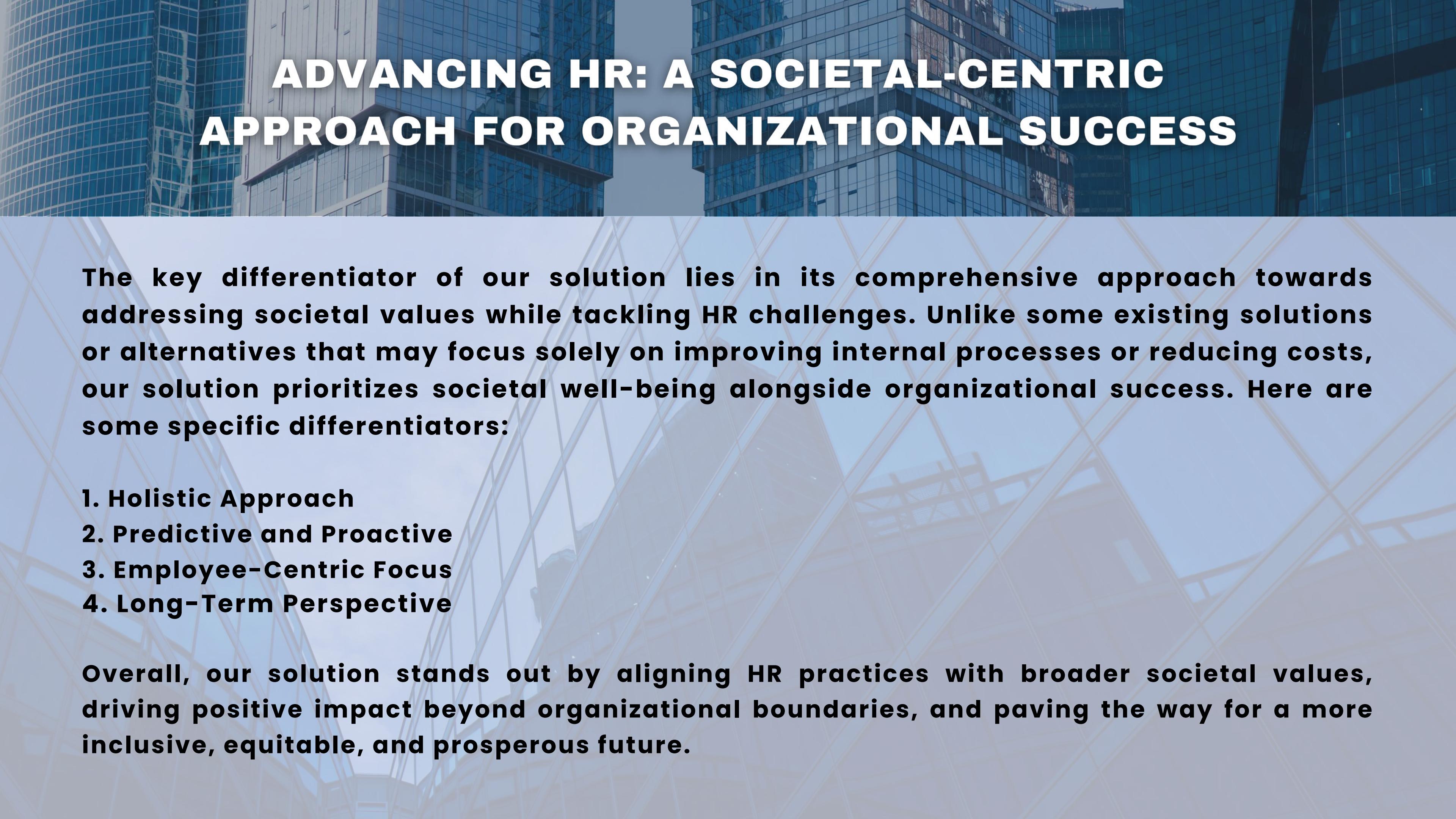
**Work-Life Balance:** By prioritizing initiatives to improve work-life balance, organizations promote employee well-being and mental health, leading to happier, healthier individuals who contribute positively to their families and communities.



# **EXPLORING HR TECH: INSIGHTS FROM CASE STUDIES**

# CASE STUDY 1: TECH STARTUP REDUCES ATTRITION THROUGH BEHAVIORAL INTERVIEW ANALYSIS

- **Challenge:** A young tech startup faced high employee turnover, particularly within the first six months. Exit interviews revealed a disconnect between the interview process and actual job responsibilities.
- **Solution:** The company implemented a structured behavioral interview format focusing on past experiences and problem-solving approaches. They also used video recording technology to capture and analyze interview behavior.
- **Data Analysis:** Analysts reviewed interview recordings, identifying patterns in successful and unsuccessful hires. They looked for specific behavioral cues that correlated with long-term success.
- **Results:** Based on the analysis, the interview process was refined to better assess cultural fit and technical skills required for the role. This led to a 20% reduction in attrition rate within the first year and improved team dynamics.



# **ADVANCING HR: A SOCIETAL-CENTRIC APPROACH FOR ORGANIZATIONAL SUCCESS**

**The key differentiator of our solution lies in its comprehensive approach towards addressing societal values while tackling HR challenges. Unlike some existing solutions or alternatives that may focus solely on improving internal processes or reducing costs, our solution prioritizes societal well-being alongside organizational success. Here are some specific differentiators:**

- 1. Holistic Approach**
- 2. Predictive and Proactive**
- 3. Employee-Centric Focus**
- 4. Long-Term Perspective**

**Overall, our solution stands out by aligning HR practices with broader societal values, driving positive impact beyond organizational boundaries, and paving the way for a more inclusive, equitable, and prosperous future.**

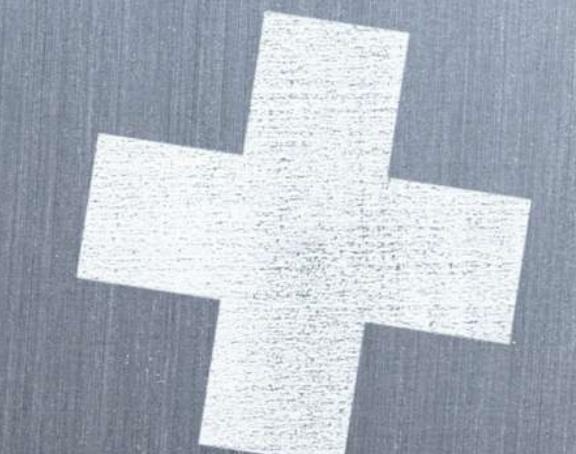
# **WHATS NEW IN OUR SOLUTION SUGGESTS**

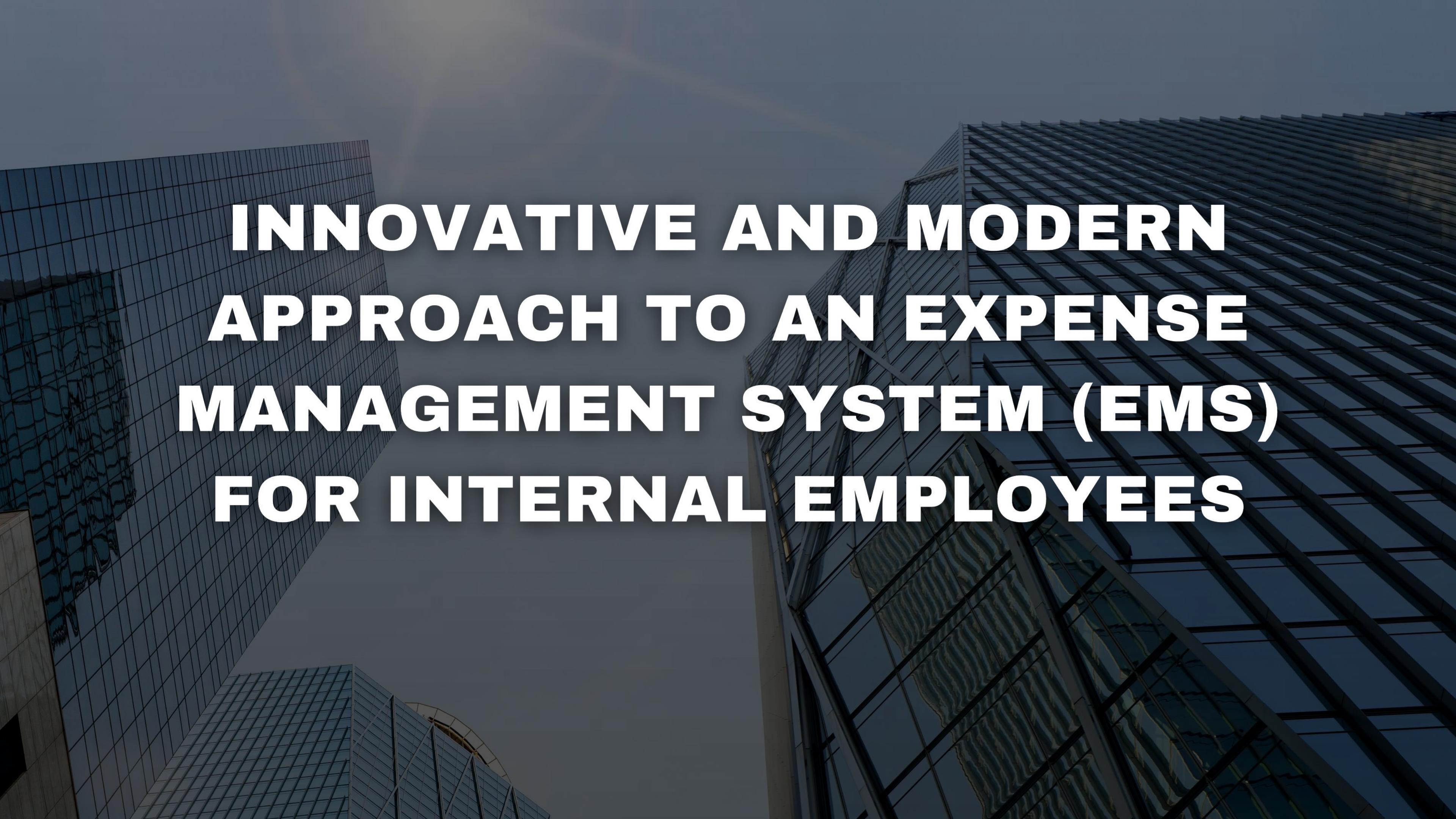
**Combining these innovative solutions with data analytics like those discussed in the case studies can create a robust hiring and retention strategy. By focusing on candidate fit, skills development, and a positive work environment, companies can attract and retain top talent.**

# EXPENSE SYSTEM MANAGEMENT



1





# **INNOVATIVE AND MODERN APPROACH TO AN EXPENSE MANAGEMENT SYSTEM (EMS) FOR INTERNAL EMPLOYEES**

# GAMIFIED EXPENSE MANAGEMENT WITH AI-POWERED INSIGHTS

- **Points and Badges:** Earn points for timely expense submissions and adhering to company policies. Unlock badges for achieving spending milestones or exceeding budget accuracy.
- **Leaderboards:** Track individual and team performance on expense management metrics. Foster friendly competition and encourage positive spending habits.
- **Challenges:** Participate in short-term challenges like "most efficient travel expense report" or "zero receipt backlog." Earn bonus points and recognition for completing challenges.

# AI-POWERED INSIGHTS AND AUTOMATION:

- **Smart Receipt Capture:** Utilize optical character recognition (OCR) technology to automatically extract data from receipts. Employees simply upload photos, eliminating manual data entry.
- **Predictive Expense Budgeting:** AI analyzes historical spending data to suggest personalized budgets for employees and departments.
- **AI-powered Policy Compliance:** AI flags potential policy violations in real-time, alerting employees and managers for review before submission.
- **Automatic Expense Categorization:** Go beyond pre-defined categories. Machine learning can learn from past submissions and automatically suggest the most accurate category for each expense.

# ADDITIONAL INNOVATIVE FEATURES:

- **Voice-activated Expense Entry:** Allow employees to submit expenses hands-free using voice commands through a mobile app or smart speaker integration.
- **Social Recognition:** Integrate with internal social platforms to allow employees to share best practices and recognize colleagues for responsible expense management.
- **Carbon Footprint Tracking:** Calculate the carbon footprint associated with travel and other expenses, promoting sustainability awareness and encouraging eco-conscious choices.



# BENEFITS

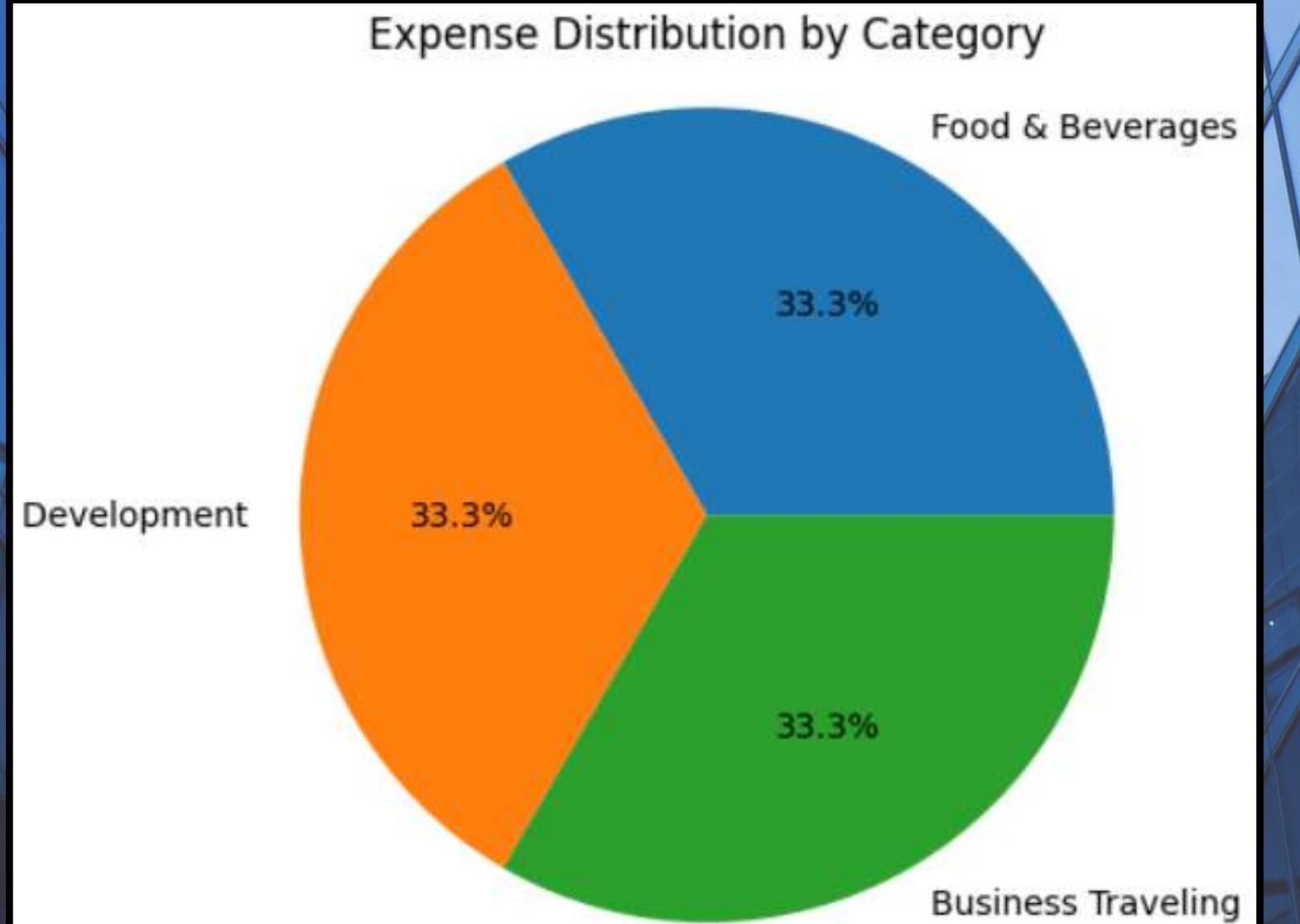
- **Increased Employee Engagement:** Gamification elements and social recognition boost employee participation and make expense management more enjoyable.
- **Improved Efficiency:** AI-powered features like smart capture and categorization save time and reduce manual effort.
- **Enhanced Accuracy and Compliance:** Real-time insights and policy checks minimize errors and ensure adherence to company rules.
- **Data-driven Decision Making:** AI can generate spending analytics to identify areas for cost-saving opportunities and resource optimization.
- **Sustainable Practices:** Carbon footprint tracking promotes transparency and encourages eco-conscious choices within the organization.

```

from datetime import datetime

def add_expense(expenses):
    date = input("Enter the date of the expense (YYYY-MM-DD): ")
    description = input("Enter a description for the expense: ")
    category = input("Enter the category of the expense: ")
    amount = float(input("Enter the amount of the expense: "))
    employee_id = input("Enter the employee ID: ")
    department = input("Enter the department: ")
    expenses.append({'Date': date, 'Description': description, 'Category': category, 'Amount': amount,
                     'EmployeeID': employee_id, 'Department': department})

```



```

def main():
    expenses = []
    while True:
        print("\nExpense Management System\n")
        print("1. Add Expense")
        print("2. Generate Expense Report")
        print("3. Exit")
        choice = input("\nEnter your choice: ")

        if choice == '1':
            add_expense(expenses)
        elif choice == '2':
            generate_report(expenses)
        elif choice == '3':
            print("Exiting...")
            break
        else:
            print("Invalid choice. Please try again.")

    if __name__ == "__main__":
        main()

```

- Overall, the Expense Management System offers a practical solution for organizations to track, analyze, and manage expenses effectively. By providing valuable insights into spending patterns and facilitating informed decision-making, the system contributes to better financial management and organizational efficiency.

# END CONCLUSION

- This project harnesses data analytics to revolutionize talent management, leveraging external sources for holistic candidate evaluation and behavioral interview analysis. Through predictive modeling of employee performance data and proactive retention strategies, it anticipates resignation risks and enhances workforce engagement. Innovative features in the Expense Management System, including gamification and AI-powered automation, optimize spending and promote sustainability, empowering companies to thrive in a competitive market.

THANK  
YOU

