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## TECHNICAL REPORT OF PROJECT THREE

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### Introduction

The aim of this analysis is to evaluate employee performance for HR analytics to provide valuable insights to the organizations in terms of employee engagement, productivity and overall organizational effectiveness.

For this analysis, I used Microsoft Excel along with PivotTables to summarize the data, which was then visualized through charts. The analysis focused on the performance by department, age, educational background of the employees and the recruitment channel.

### Story of the Data

This data set was gotten from [kaggle.com](https://www.kaggle.com)

This data tells a story of workforce performance and helps HR teams make data-driven decisions to improve employee engagement, productivity, and retention.

## Importance Features

- Employee ID ; Unique identifier for tracking performance.
- Department ; Helps analyze performance differences across teams.
- Region ; Identifies geographical performance trends.
- Gender ; Allows for diversity and equity analysis.
- Education ; Examines the impact of education on job performance.
- KPIs Met ; Measures overall employee success (Primary Performance Metric)..
- Awards Won ; Identifies top performers and recognition impact.
- Length of Service ; Determines how tenure impacts performance.
- Age ; Helps analyze workforce trends and generational performance.
- Number of Trainings ; Measures investment in employee development.
- Recruitment Channel ; Assesses which hiring sources produce top performers.

## Data Splitting and Preprocessing

### Data Cleaning

- The top row was frozen to enhance navigation and proper casing was applied to all column headers for consistency.
- The data was represented on a standard excel table.

### Data Splitting

For this, the data was split into two variables; the dependent and independent variables.

Independent variables such as; Department, Employee ID, Region, Education

Dependent variables such as; KPI, Age

## Pre Analysis

The potential analyses for employee performance in HR analytics cover several key areas. Department-wise performance analysis helps identify which departments have the highest and lowest performers. The effect of training on employee performance examines whether employees who undergo more training achieve better results. Experience vs. performance explores how tenure influences productivity and efficiency. Analyzing trends in previous year ratings and performance provides insights into consistency and improvement over time. The effectiveness of recruitment channels assesses which hiring sources produce the most successful employees. Finally, the impact of awards and recognition on performance helps determine whether employee motivation and achievements are linked to recognition programs. These insights can drive data-driven HR decisions and improve overall workforce effectiveness.

### **In Analysis**

1. The Operations department leads in performance with a KPI of 1553, followed by Marketing (1513), while Legal (118) has the lowest KPI.
2. Employees with only one training had the highest KPI (5170), while those with the most training performed lower.
3. Male employees outperformed female employees, contributing 68% of the total KPI, while females contributed 32%.
4. Referred employees generated the lowest KPI (169), while direct hires & sourced employees performed better with 3450 and 2631 KPI, respectively.
5. Employees with a bachelor's degree achieved the highest KPI (4,123), followed by employees with a master's degree and above at 1,783 KPI.
6. The 30-34 age group recorded the highest KPI of 2,003, followed by the 25-29 age group with 1,479 KPI, while the 55-60 age group had the lowest KPI of 151.
7. Employees who received no awards had a total KPI of 5,971, whereas employees who received one award had a significantly lower KPI of 179.

### **Recommendations**

1. Boost Performance in the Legal Department by Assessing workload distribution and role alignment within the Legal department and provide role-specific training & resources to enhance efficiency.
2. Evaluate Training Effectiveness by Reviewing training programs to ensure quality over quantity—focus on practical application rather than excessive sessions.and also Implement personalized learning paths to improve engagement and results.
3. Bridge the Gender Performance Gap by Identifying barriers affecting female employees' performance (e.g., work environment, leadership opportunities).and promote mentorship programs, flexible work policies, and career development initiatives for women.
4. Optimize Recruitment Strategies by Strengthening referral programs by ensuring high-quality candidate screening & better role alignment.
5. Since employees with a bachelor's degree have the highest KPI, it is worth analyzing whether their roles require less specialization or if additional professional training can help employees with higher degrees improve performance. Consider offering tailored skill development programs.
6. The 30-34 age group demonstrates the highest productivity. The organization can leverage this by focusing leadership development and retention strategies on this age group. For employees aged 55-60, mentorship programs and flexible work policies may help improve performance.
7. The significantly lower KPI for awarded employees suggests that awards may not be effectively linked to performance. Reevaluate the criteria for awards and explore performance-based incentives, such as skill-based promotions or bonuses.

## **Post Analysis and Insights**

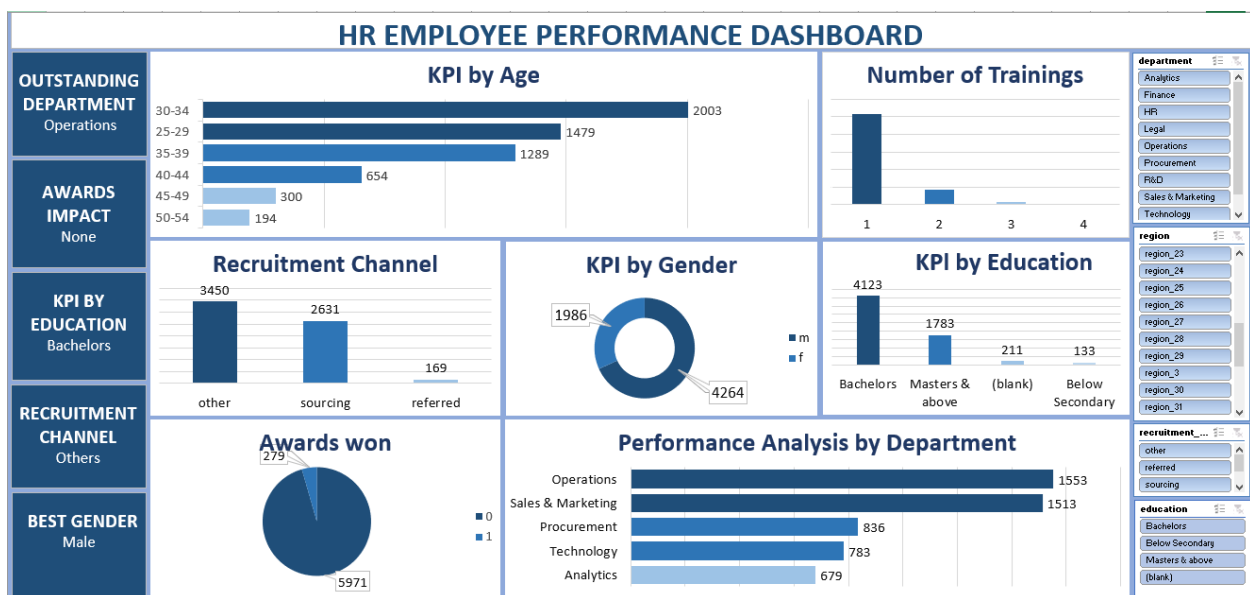
1. The analysis highlights key performance trends among employees based on education level, age group, and awards received. Employees with a bachelor's degree showed the highest productivity (KPI: 4,123), suggesting that specialized education beyond this level may not always translate to better performance. The 30-34 age group had the highest KPI (2,003), indicating strong productivity in early

career stages, while the 55-60 age group had the lowest KPI (151), highlighting potential challenges in senior employee performance.

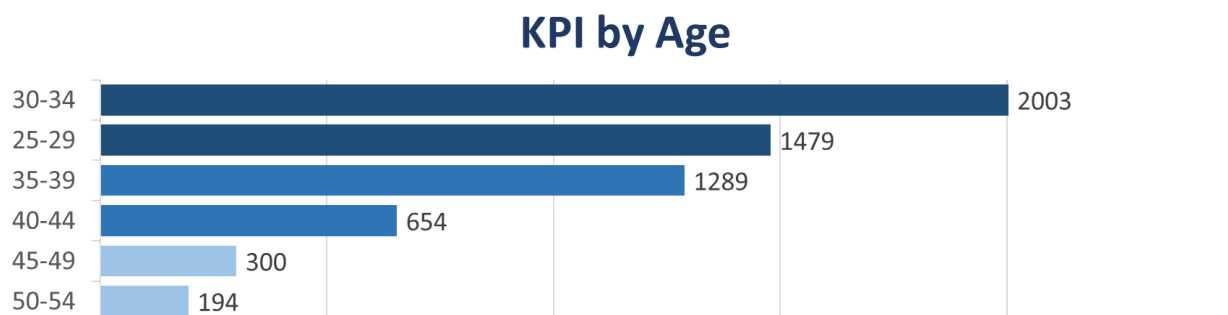
2. Interestingly, employees who received no awards had a significantly higher total KPI (5,971) than those who received one award (179), questioning the effectiveness of the award system in driving performance

## Data Visualization and Charts

### Dashboard



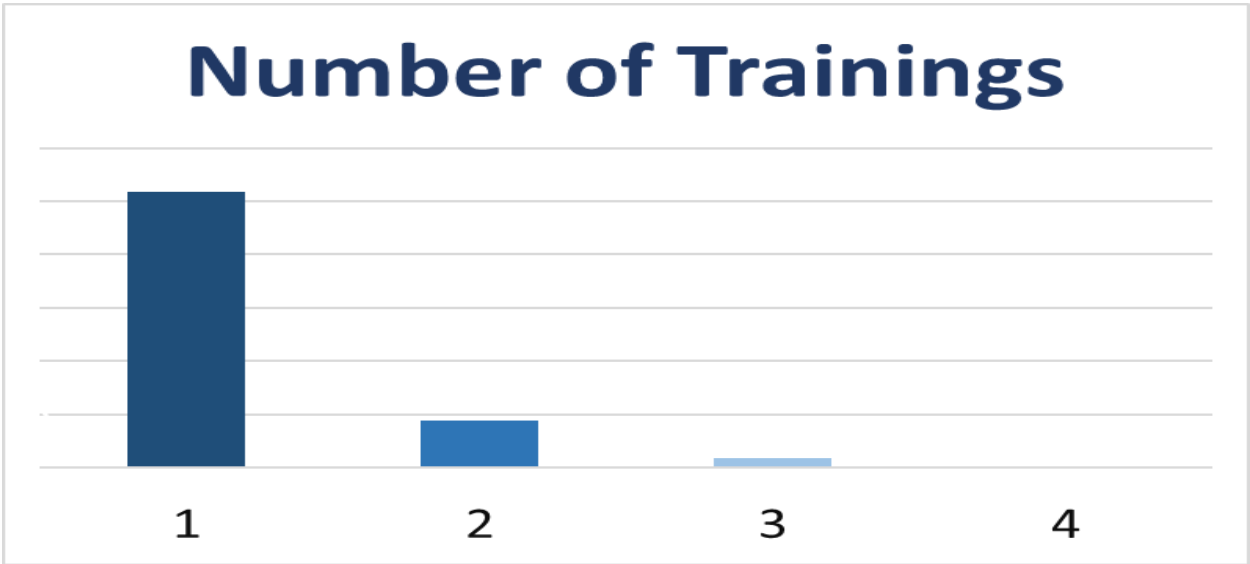
### KPI by Age



The bar chart shows that employees aged 30-34 and 25-29 have the highest KPI, indicating peak productivity in these age groups. KPI declines as employees get older, with the lowest performance seen in the 55-60 age group. Younger employees (20-24)

also have a relatively low KPI, likely due to a lack of experience. These insights suggest the need for training programs to enhance skills among younger employees and initiatives to sustain productivity among older employees.

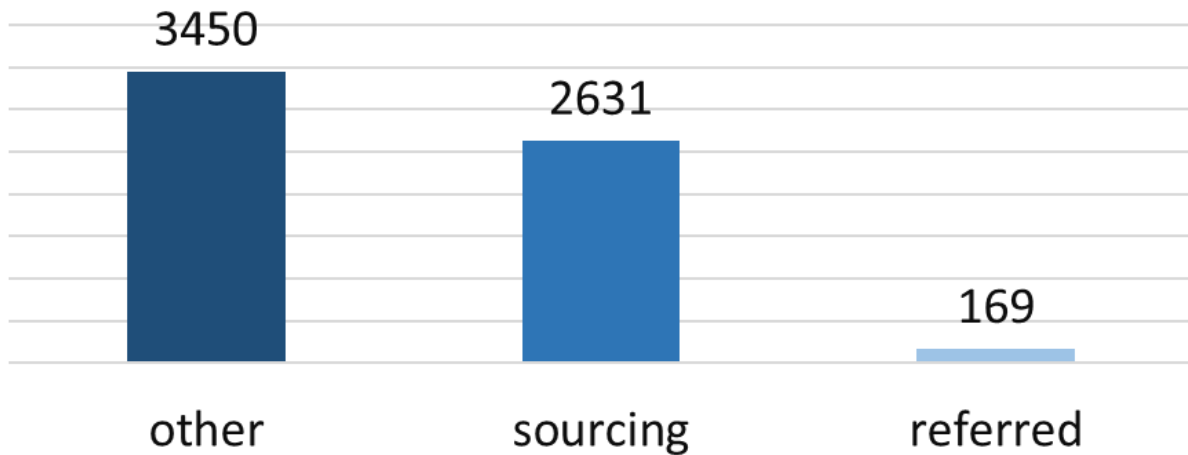
**Number of Trainings**



The chart illustrates the relationship between the number of trainings attended and employee performance. Employees who attended only one training achieved the highest KPI, while those with multiple training showed a significant decline in performance. This suggests that excessive training may not be translating into productivity improvements and could indicate training inefficiency or employee fatigue. To enhance effectiveness, the company should evaluate training content, ensure relevance, and balance learning with practical application.

**Recruitment Channel on Performance**

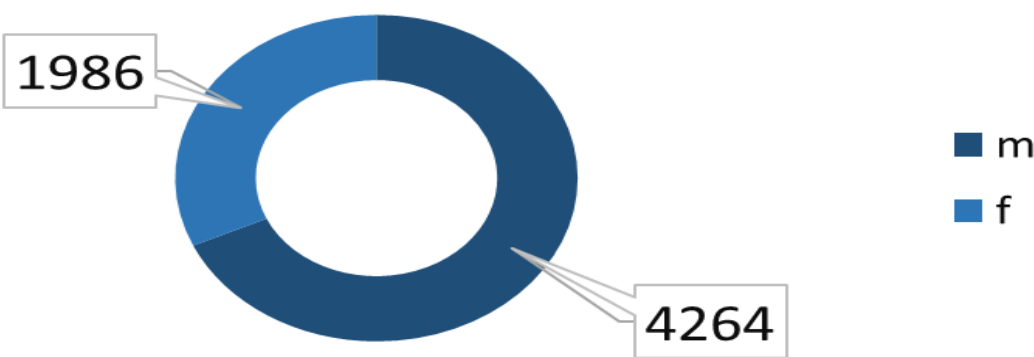
# Recruitment Channel



The chart illustrates the impact of different recruitment channels on performance. Employees hired through "other" channels have the highest performance (3450), followed by those recruited through sourcing (2631). In contrast, employees hired through referrals show significantly lower performance (169). This suggests that referrals may not be an effective hiring method for high performance, while alternative recruitment strategies yield better results. The company should analyze the effectiveness of each hiring method, refine referral processes, and focus on high-performing channels to improve workforce quality.

## KPI by Gender

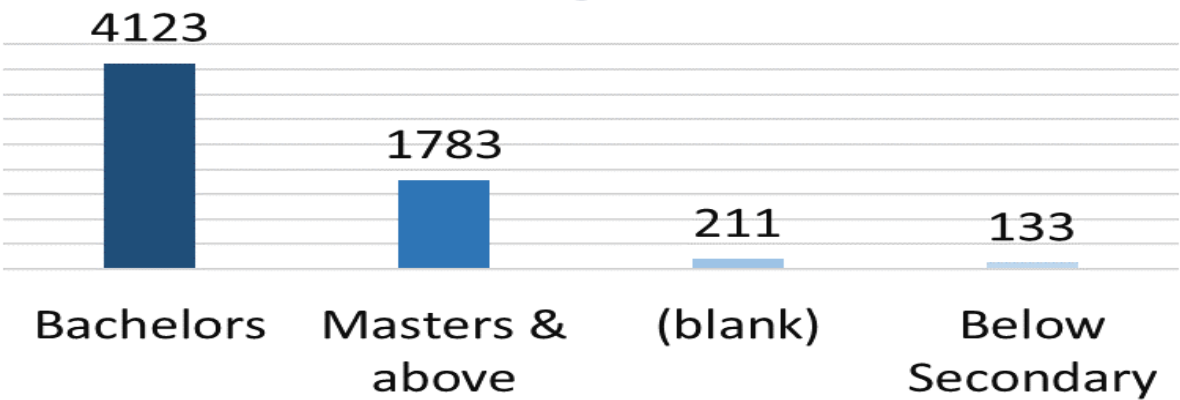
# KPI by Gender



The KPI by Gender chart shows that females (f) have a significantly higher KPI score of 4264, compared to males (m) with a KPI score of 1986. This indicates that female employees are performing at a higher level than their male counterparts based on the given KPI measurement. The organization could investigate the underlying factors contributing to this difference, such as work roles, responsibilities, or support systems, to enhance overall performance and ensure balanced productivity across genders.

## KPI by Education

# KPI by Education

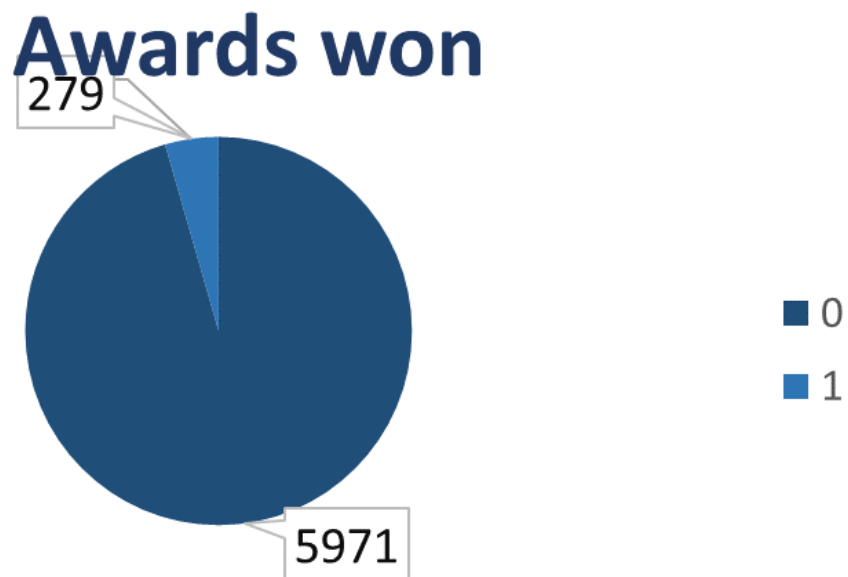


The KPI by Education chart indicates that individuals with a Bachelor's degree have the highest KPI score (4123), followed by those with a Master's degree or higher (1783). Individuals with below secondary education (133) and those with unknown (blank)



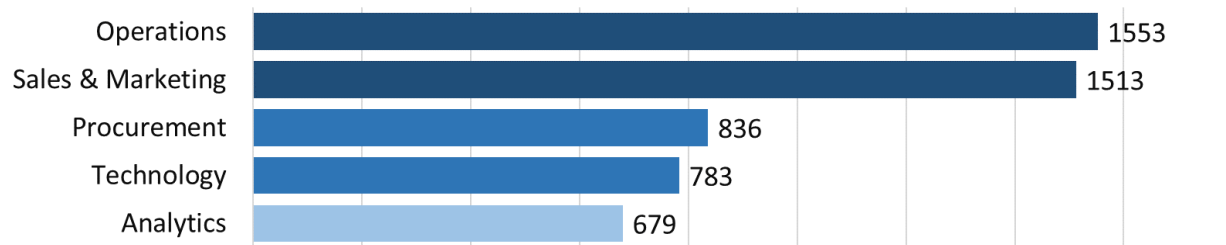
education levels (211) have significantly lower KPI scores. This suggests that higher education levels, particularly a Bachelor's degree, are associated with better performance. Organizations may consider focusing on hiring individuals with at least a Bachelor's degree or providing additional training and development programs for employees with lower educational qualifications to improve performance.

### Awards Won



The Awards Won chart shows that a vast majority of individuals (5971) have not won any awards, while only a small portion (279) have received awards. This suggests that either the award criteria are highly competitive or that performance recognition is limited. To encourage higher performance and motivation, the organization could consider expanding award programs, introducing new recognition incentives, or improving transparency in the awarding process to ensure more employees are acknowledged for their contributions.

## Performance Analysis by Department



The Performance Analysis by Department chart shows that the Operations (1553) and Sales & Marketing (1513) departments have the highest performance figures, indicating their significant contribution to the organization's success. Procurement (836) and Technology (783) follow, showing strong but lower performance compared to the top two departments. The Analytics department (679) also plays a substantial role. However, Finance (319), HR (300), R&D (149), and Legal (118) have the lowest performance values, which could indicate lower workload, fewer performance-driven tasks, or potential areas for improvement. Organizations may explore ways to optimize performance in these departments through better resource allocation, training, or process improvements.

### Observations

1. Male employees have a higher KPI value (1,809) compared to female employees (822).
2. The Operations department has the highest KPI, confirming its strong productivity.
3. Employees recruited through referrals have the lowest total KPI (169), while "Others" as a recruitment channel has the highest KPI (1,018).
4. The Technology department leads in performance within specific roles, with a KPI value of 41. Male employees in this department have a KPI of 116, while female employees have 53.
5. Region 2 consistently tops performance charts with the highest KPI values (460).
6. Employees with a bachelor's degree have the highest KPI (4,123), while those with a master's degree or above have a KPI of 1,783.

7. Employees with one training session had the highest KPI (3,380), while those with two training sessions had a lower KPI (600).
8. Experience does not significantly impact performance in this dataset.
9. The best-performing department is Operations (1,076 KPI), followed by Sales & Marketing and Technology.

## **Recommendations**

1. Investigate factors contributing to the performance disparity between male and female employees. Implement targeted mentorship programs and skill development initiatives.
2. Analyze the strategies used in the Operations department and apply them across other departments to improve overall productivity.
3. Reassess the referral hiring process and refine it to attract high-performing candidates. Expand recruitment strategies that have yielded better KPI outcomes.
4. Provide targeted training and support to female employees in technology roles to improve their KPI performance.
5. Identify key success factors in Region 2 and apply them to lower-performing regions to enhance overall efficiency.
6. Evaluate whether employees with master's degrees or above are in roles that fully utilize their skills. Implement career progression plans to ensure their expertise is leveraged effectively.
7. Ensure training sessions are outcome-driven and relevant to employees' roles. Focus on improving the quality rather than increasing the number of training sessions.
8. Conduct further analysis to determine if experience contributes indirectly to leadership or problem-solving skills. Adjust job roles and responsibilities accordingly.
9. Use insights from high-performing departments to develop strategies for weaker departments. Promote collaboration and knowledge sharing between teams.

## **Conclusion**

The analysis reveals significant performance disparities between male and female employees, with males consistently achieving higher KPI values. The Operations department emerges as the top-performing division, followed by Sales & Marketing and Technology. Region 2 consistently outperforms other regions, suggesting location-based influences on productivity. Employees hired through referrals show the lowest KPI, while those recruited through other channels perform better. In terms of education, employees with a bachelor's degree achieve the highest KPI, while those with a master's degree or higher do not show significantly better performance. Interestingly, employees who received only one training session performed better than those with multiple training sessions, raising concerns about the effectiveness of the training programs. Additionally, experience level does not appear to significantly impact KPI, suggesting that other factors, such as motivation or job role, may play a more influential role in performance.

## **Limitations**

1. **Data Scope:** The analysis is limited to the available dataset and may not capture all relevant performance drivers, such as motivation, work environment, or leadership quality.
2. **Causation vs. Correlation:** The data highlights trends, but it does not establish causality (e.g., why training does not correlate with higher KPI).
3. **Lack of Qualitative Insights:** The dataset lacks qualitative feedback from employees that could provide deeper insights into the performance drivers.
4. **Training Quality Not Considered:** The analysis does not assess the content or effectiveness of the training programs, which could impact employee productivity.

## **Future Research**

1. **Gender Disparity Analysis:** Investigate the underlying reasons behind the performance gap between male and female employees and implement strategies to bridge it.

2. Training Program Evaluation: Assess the quality, relevance, and delivery methods of training programs to optimize employee learning and productivity.
3. Recruitment Strategy Optimization: Conduct a deeper study on why referral-based recruitment leads to lower performance and explore ways to improve the hiring process.
4. Longitudinal Performance Tracking: Track employees' performance over time to assess how factors like experience, training, and department changes influence long-term productivity.

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