**From Office to Home: Remote Work’s Impact on Productivity and Resignation**

Exploratory Data Analysis

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## Problem Statement:

Remote work has become a cornerstone of modern workplace dynamics, particularly in the wake of the COVID-19 pandemic. Businesses across industries are increasingly adopting hybrid and fully remote work models, leading to significant changes in employee productivity, satisfaction, and turnover rates. However, the long-term effects of remote work on these key employee outcomes remain unclear, leaving companies uncertain about how to optimize their remote work policies.

Using this dataset, you will investigate how remote work frequency correlates with employee performance, job satisfaction, and resignation rates. The objective is to uncover actionable insights into how different levels of remote work impact employees’ productivity and likelihood of resigning. With this data, the project aims to help organizations design evidence-based policies that balance productivity and employee retention while supporting a flexible work culture.

Business Impact:

Exploring this dataset may help companies gain valuable insights into how workplace dynamics affect employees across various areas. By analyzing how workplace changes over time influence outcomes such as employee retention, productivity, job satisfaction, organizations can make data-driven decisions. This includes identifying trends in employment locations over time (time series analysis) to better understand the impact of remote work and optimize workplace strategies for long-term success.

General Dataset Information:

File name:Extended\_Employee\_Performance\_and\_Productivity\_Data.csv

Description: This dataset contains information for 100,000 employees hired between 2014 and 2024 in a corporate environment. It provides comprehensive details related to their workplace, performance, productivity, and demographics.

Dataset Details: 100,000 rows & 20 Columns.

Size: 10,969.6 KB (10.7 MB)

Source: Kaggle -[Dataset\_link](https://www.kaggle.com/datasets/mexwell/employee-performance-and-productivity-data/data)

# Target Features:

The columns that will be used to simplify and analyze the problem statement are:

1. **Department:** Indicates the employee's department, helping analyze trends across different organizational areas.
2. **Gender:** Used to examine how workplace dynamics affect employees of different genders.
3. **Education\_Level:** Represents the employee's educational background, which may correlate with performance and career progression.
4. **Hire\_Date:** Tracks when employees were hired, enabling time-series analysis of employment trends.
5. **Career\_Progression:** Highlights employees’ career growth, helping assess the impact of remote work on advancement opportunities.
6. **Age\_Group:** Groups employees by age to analyze trends across different generations.
7. **Performance:** Reflects employees' performance ratings, used to evaluate productivity outcomes.
8. **Monthly\_Salary:** Provides insights into compensation trends and their relationship with employee satisfaction and retention.
9. **Remote\_Work\_Frequency:** Indicates how often employees work remotely, a key variable for assessing remote work's impact.
10. **Employee\_Satisfaction:** Measures job satisfaction, crucial for understanding workplace dynamics.
11. **Work\_Hours\_Per\_Week:** Tracks weekly working hours, which can reveal workload patterns and burnout risks.
12. **Projects\_Handled:** Shows the number of projects managed by an employee, providing insight into productivity.
13. **Overtime\_Hours:** Captures extra hours worked, used to analyze work-life balance and its effects.
14. **Sick\_Days:** Tracks employee absences due to illness, which can indicate workplace stress or health trends.
15. **Promotions:** Reflects career advancement, useful for studying the effect of workplace policies on growth opportunities.
16. **Training\_Hours:** Indicates time spent on training, which may correlate with performance and career development.
17. **Resigned:** Identifies whether an employee has resigned, essential for studying retention and turnover trends(True/False).

List of Analysis:

**Analysis 1: Distribution of Gender, Age Group, and Remote Work Frequency**

Using pivot tables, the distribution of Gender, Age\_Group, and Remote\_Work\_Frequency was analyzed to gain a deeper understanding of the dataset. The gender distribution revealed that male and female counts are nearly equal, with each accounting for 50% of the workforce, as visualized in a Pie Chart. For the age group distribution, a Clustered Column Chart showed that the majority of employees fall within the 50-60 age group, while the 22-29 age group is the least represented. Additionally, the 30-39 and 40-49 age groups have similar counts, indicating a balanced distribution across these mid-career age ranges. Lastly, the remote work frequency distribution, represented by a Bar Chart, highlighted that hybrid work is the most prevalent trend, significantly surpassing other remote work frequencies. This suggests that hybrid work, which combines onsite and remote working, has become a dominant corporate approach among organizations.

### **Analysis 2: Cross Distribution of Remote Work Frequency with Department, Gender, and Age Group**

The analysis of remote work frequency across departments, gender, and age groups revealed several key insights. First, the distribution across departments showed a consistent trend, with hybrid work frequency being the most common in all departments, as illustrated in the stacked bar chart. This indicates that hybrid work is a universal approach, adaptable to any department, with no exceptions. It suggests that all departments can effectively implement hybrid work policies, balancing remote and onsite requirements as needed. Second, the cross-distribution analysis by gender revealed no significant differences between males and females, as both genders showed similar results for hybrid, onsite, and remote work frequencies. This highlights that gender does not impact the ability or preference for remote work. Finally, the analysis across age groups revealed an interesting generational difference: older employees (50-60 years old) tend to prefer onsite work more than younger employees, while younger employees (22-29 years old) show a higher preference for remote and hybrid work models. These findings highlight the importance of tailoring remote work policies to accommodate generational differences while ensuring inclusivity and adaptability across all departments and demographics.

### **Analysis 3: Remote Work Frequency Over Time**

The analysis of remote work frequency over time, based on the Hire\_Date, reveals significant trends in workplace dynamics. From 2014 to 2024, the adoption of Hybrid Work has shown a consistent upward trend, becoming the dominant work model in recent years. The data indicates a sharp increase in hybrid work adoption after 2020, likely influenced by the global shift in work policies during the COVID-19 pandemic. Conversely, Onsite Work has steadily declined over the years, reflecting a gradual move away from traditional office-based setups. Remote Work, while less common than hybrid work, has experienced slight growth, particularly in the post-2020 period. By 2024, hybrid work has solidified as the preferred approach, offering a balance between flexibility and productivity. These findings highlight a clear shift in organizational strategies toward adopting hybrid work models, while maintaining provisions for remote and onsite work as necessary.

### **Analysis 4: Employee Retention Analysis**

The analysis of resignation rates across different remote work frequencies reveals insightful trends. The **Hybrid Work** model has the highest number of employees, with a resignation rate of approximately **11.33%**, slightly higher than **Onsite Work** at **10.43%**. The **Remote Work** model, while accommodating fewer employees overall, has the highest resignation rate at **11.37%**. This suggests that although hybrid and onsite work policies retain employees more effectively, fully remote roles may face challenges in retaining staff. The overall distribution indicates that hybrid work continues to dominate as the preferred work arrangement, balancing flexibility and retention. These findings highlight the importance of offering balanced work models to improve employee satisfaction and reduce turnover.

### **Analysis 4: Employee Satisfaction Analysis**

The analysis of Employee Satisfaction across Remote\_Work\_Frequency, Age\_Group, and Gender reveals interesting patterns. For employees working under the Hybrid Work model, satisfaction scores are consistently higher across all age groups and genders, with the highest average being 3.02 for males aged 40-49. Onsite Work shows slightly lower satisfaction levels, with notable variability, particularly among younger employees aged 22-29, where females score higher than males. The Remote Work model has the lowest satisfaction scores overall, with averages ranging between 2.97 and 3.00, indicating that fully remote setups may not meet the needs of employees as effectively as hybrid or onsite models.

Across all work frequencies, older employees (50-60) show more consistent satisfaction levels compared to younger groups (22-29), where satisfaction tends to vary more significantly. The results highlight that hybrid work provides the most balanced satisfaction levels across demographics, making it the preferred choice for organizations aiming to improve employee morale and engagement.

### **Analysis 4: Performance and Employee Satisfaction Analysis**

The analysis of Performance and Employee Satisfaction across Remote\_Work\_Frequency and Gender provides critical insights. The results show that Hybrid Work consistently achieves the highest levels of performance and satisfaction for both males and females, with an average performance score of 3.00 and the majority of employees reporting satisfaction. This highlights the effectiveness of hybrid work in balancing productivity and employee morale.

In contrast, Onsite Work displays slightly lower satisfaction and performance levels, particularly for males, with an average performance score of 2.99. Remote Work, while maintaining a strong average performance score of 3.00, reveals a greater proportion of employees reporting neutral or dissatisfied experiences compared to hybrid work, particularly among females.

These findings suggest that Hybrid Work not only supports high performance but also fosters a more positive employee experience, making it the preferred model. However, Remote Work may require additional strategies to improve engagement and satisfaction, particularly for female employees, while Onsite Work could benefit from integrating more flexibility to enhance overall satisfaction. These insights can guide organizations in tailoring work policies to maximize both performance and employee well-being.

### **Conclusion**

This analysis examined the impact of Remote\_Work\_Frequency on key employee metrics such as satisfaction, performance, and retention, alongside breakdowns by Age\_Group, Gender, and Department. The findings revealed that Hybrid Work consistently achieves the highest satisfaction and performance levels across all demographics, making it the most effective workplace model. While Remote Work supports strong performance, it showed slightly lower satisfaction, particularly among female employees. Onsite Work had the lowest satisfaction and performance scores, especially for younger employees, highlighting the growing demand for flexibility in traditional setups. Retention trends showed higher resignation rates in fully remote roles compared to hybrid and onsite setups. Age-based analysis indicated that younger employees (22-29) prefer hybrid and remote work, while older employees (50-60) lean towards onsite models. These insights underscore the importance of tailoring workplace policies to meet the diverse needs of employees while prioritizing hybrid work for its adaptability and effectiveness.