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MIS770 - Foundation Skills In Data Analysis

T1 2024 MIS770 Assignment 2

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Executive Summary

Our analysis highlights employees' perceptions of skill preparedness, with a majority feeling adequately or very prepared. While work experience influences salary, it's not the sole determinant. Gender shows no significant impact on AI impact expectations, and age doesn't strongly correlate with job displacement concerns. The average weekly workload falls between 44.45 and 46.42 hours with 95% certainty. While inclusivity ratings indicate a significant perception of inclusivity, there's room for improvement. Lastly, our staff's average annual salary is confidently higher than $75,000, suggesting competitive compensation practices.

Introduction

In this report, we delve into the recent Employee Survey data to address various inquiries crucial for organizational planning and decision-making. The analysis encompasses summaries of key variables, exploration of relationships between variables, estimation of employee measures, and validation of insights highlighted by an industry report. Questions range from understanding salary distributions and skill preparedness to investigating potential correlations between variables like work experience and income, gender and AI impact expectations, and age and job displacement concerns. Additionally, we estimate employee workload and inclusivity ratings, and propose sample size requirements for future surveys to ensure robust data accuracy.

Report

**Summaries of individual key variables of interest:**

**Annual Salary** – Through our analysis of the 400 employees' data, the Annual Salary variable reveals the range of salaries within the group. The lowest observed salary is $38.9, while the highest is $202.5. However, the median salary, representing the midpoint of all ordered salaries from minimum to maximum, is $71. The wide spread in the salary range is primarily influenced by rare extreme outliers of salaries above $151,125, identified through statistical methods. Approximately 80% of the salary distribution lies between $45,000 and $105,000 which provides us a clearer understanding of the typical salary range of the employees.

**Skill Preparedness -** The data reflects individuals' perceptions of their skill preparedness. A considerable portion, about 66.25%, feel adequately prepared, while an additional 15% consider themselves very prepared. On the other hand, a smaller group, roughly 13.25%, express feeling unprepared, with about 5.50% stating they are very unprepared. This suggests a generally positive outlook on skill readiness among the majority of employees, although there remains a notable minority who feel less confident in their preparedness.

**Exploring relationships between two variables:-**

We now investigate the relationship between two variables from the employee survey dataset. Through this analysis, we aim to identify correlations, patterns, or dependencies that may exist between them.

1. **Annual Salary and Work Experience** - We did find a connection between work experience and salary, but it's important to note that it's a weak relationship. This means that while there is some influence of work experience on salary, it's not the only factor at play. There could be other things, like education level, job role etc. that also affect how much an employee earns.
2. **Gender and AI Impact Expectations –** From analyzing the two variables we were able to observe that responses across genders have pretty similar distributions for most impact categories, with minor differences. For example, when it comes to "Introduce New Responsibilities," 38.27% of females expect this impact, while 35.65% of males do. Similarly, for "No Significant Impact," the percentages are 24.69% for females and 25.93% for males. Overall, these slight variations don't point to big differences based on gender. Other factors like job roles and experience are probably more important. So, in summary, the responses show similar patterns across genders, with only small differences in AI impact expectations.
3. **Age and Job Displacement Concern -** From analysing the two variables we were able to observe age had no observable effect on the job placement concerns as all age ranges responded similarly when asked about job placement concerns. The percentage of respondents in an age group expressing concern ("Yes") ranged from 41.98% to 55.00%, while the respondents not concerned ("No") ranged from 28.13% to 39.51%. This indicates a relatively small variation in responses across different age groups. Further, we observed there is no clear pattern or trend in the responses as the age range increases.

**Estimating employee measures –**

Using the sample survey of the 400 employees and applying statistical methods to extrapolate these values for the entire organization, we further estimate the total weekly work hours and the proportion of employees rating 'Very Inclusive' regarding organizational input on AI integration decisions.

**Weekly Workload** – From analysing the sample we can conclude with 95% certainty that the average weekly workload of our employees lies between 44.45 and 46.42 hours. This suggests that the traditional 40-hour workweek does not longer apply as our employees appear to be working slightly longer hours on average.

**Inclusivity Rating** - Based on our sample data, we estimate with 95% confidence that the proportion of all employees who rate 'Very Inclusive' for the organization's inclusivity in considering their input on the integration of generative AI decisions lies between 22.89% and 31.61%. It indicates that a significant portion of employees perceive the organization as inclusive, but there is still room for improvement to ensure a more comprehensive and inclusive decision-making process.

**Insights highlighted by industry report**

A report suggests that the average annual salary for employees in companies similar to ours stands at $75,000. This prompted concern about whether our organization's compensation package aligns with or surpasses this benchmark. Thus, after doing statistical analysis on the sample data we were able to conclude with 95% certainty that our staff's average annual salary is higher than $75,000.

Further, we aim to validate a claim in the report suggesting that fewer than 50% of employees perceive these initiatives as very effective using our survey data. After the statistical analysis on report, we failed to conclude that less than 50% of employees perceive AI initiatives as very effective in our organization. This is a positive sign for our company as the majority of employees perceive our AI initiatives as very effective.

**Future Surveys**

Concerned about the sample size's adequacy, we conducted statistical analyses to determine the necessary sample size for future surveys. For estimating the average annual salary within $2500 with 95% certainty, we require at least 490 employees. Similarly, to estimate the proportion of highly prepared employees within 3% and 95% certainty, a minimum of 545 employees is needed. Therefore, to meet both requirements simultaneously, we should include a minimum of 545 employees in the next survey. This will provide us with greater precision and reliability in our estimates while keeping the sample size small enough to survey without a significant investment from the company.

Conclusion

In conclusion, our analysis of the Employee Survey data provides valuable insights into various aspects of our organization's workforce. We've observed that our employees feel adequately prepared for AI integration and perceive inclusivity in decision-making. Additionally, while salary distributions showcase a wide range, our staff's average annual salary exceeds industry benchmarks. Our analysis of variable relationships highlights the complex factors shaping employee perceptions. These insights emphasize the need for ongoing evaluation and adaptation in strategic planning to ensure organizational effectiveness amidst AI integration. Moreover, increasing the sample size in future surveys will enhance the accuracy and reliability of our findings, enabling more precise decision-making and strategic planning.