Data Analysis Case Study Report

NSW Government Virtual Program

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Director of NSW Public Service Commission

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This report analyzes part-time employment trends within the NSW public sector, providing data-driven insights to guide policy development and workforce diversity initiatives through 2025.

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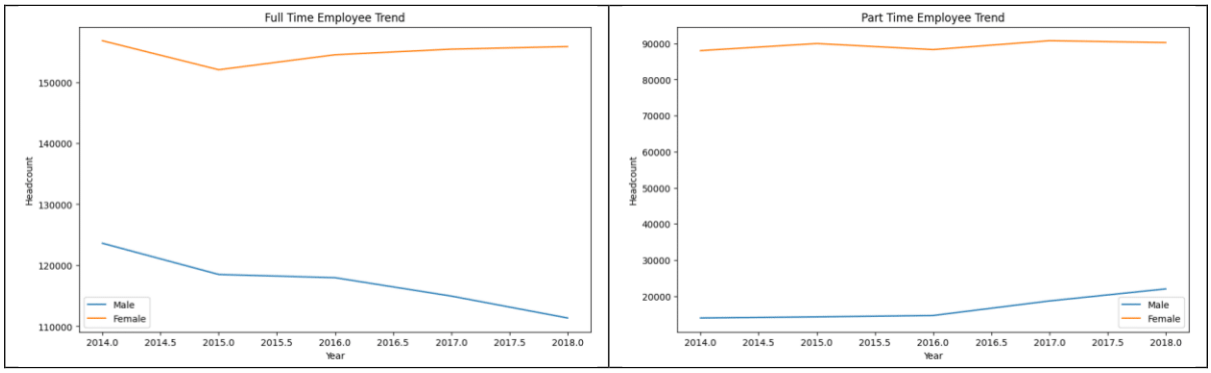
INTRODUCTION

This report analyses part-time employment trends in the NSW public sector, using data from the NSW Public Service Commission's Workforce Profile. We explore historical trends, current representation across sectors, changes over the past four years, and projections for 2025. This data-driven examination aims to inform policy development and stimulate productive discussions within the Workforce Diversity Steering Committee.

PART 1

1. Trends over time in male and female employment, including any notable changes

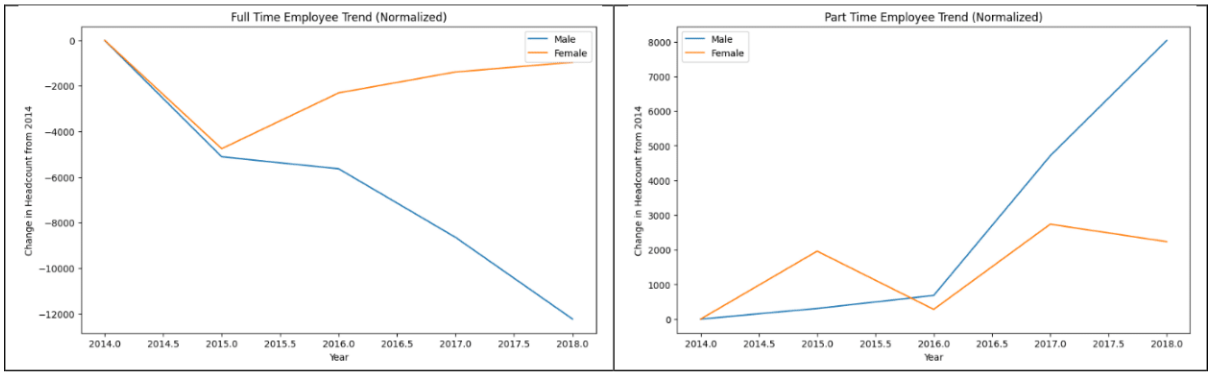
We have plotted the employment trends for both full-time and part-time male and female employees from 2014 to 2018, on a half-yearly basis, using Python.



To facilitate better comparison, we also plotted male and female trends on the same graph, starting from the same point (2014). From this, we can infer that the total number of full-time employees declined in 2015. However, while the number of female full-time employees rebounded, the male figure dropped significantly. By 2018, there was a loss of approximately 800 female employees and 12,000 male employees.

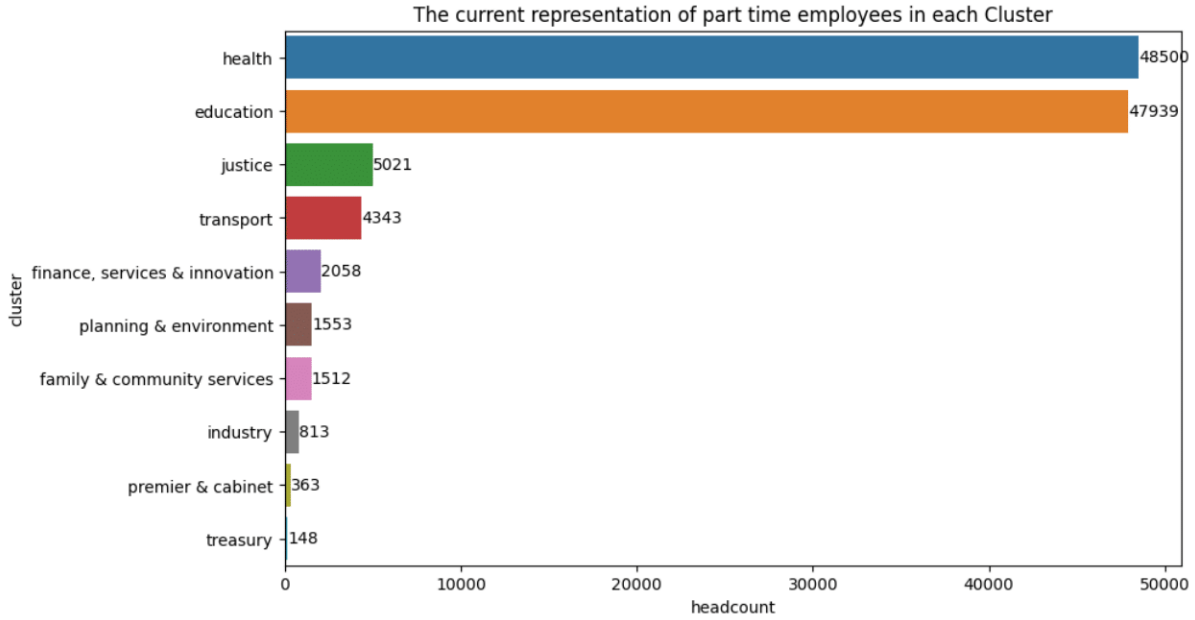
We can also infer that the total number of part-time employees has increased overall. In 2018, there were 8,000 more male employees and 23,000 more female employees working part-time compared to the previous year.

In general, there are more part-time than full-time employees.



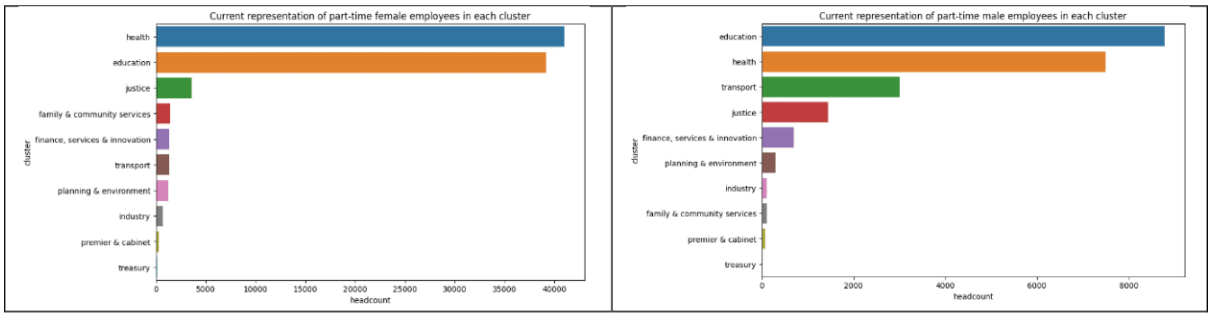
2. The current representation of part time employees in the sector and in each Cluster

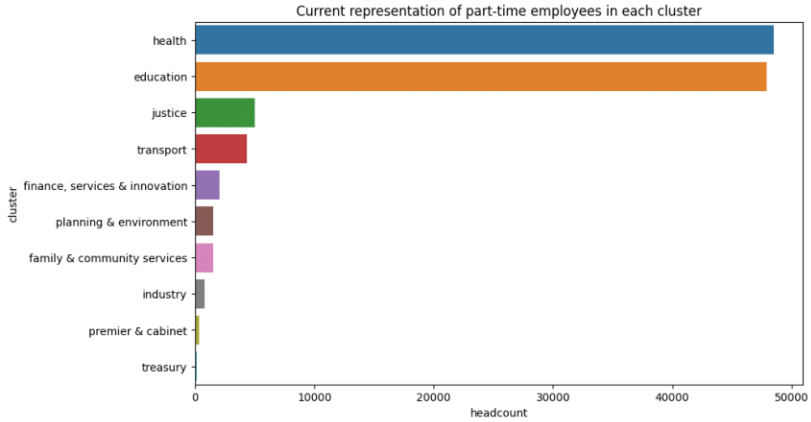
We created a bar plot using Python to visualize the total count of part-time employees in each organizational cluster for the year 2018. The Health and Education clusters have the highest representation of part-time employees, with counts of 48,500 and 47,939, respectively.



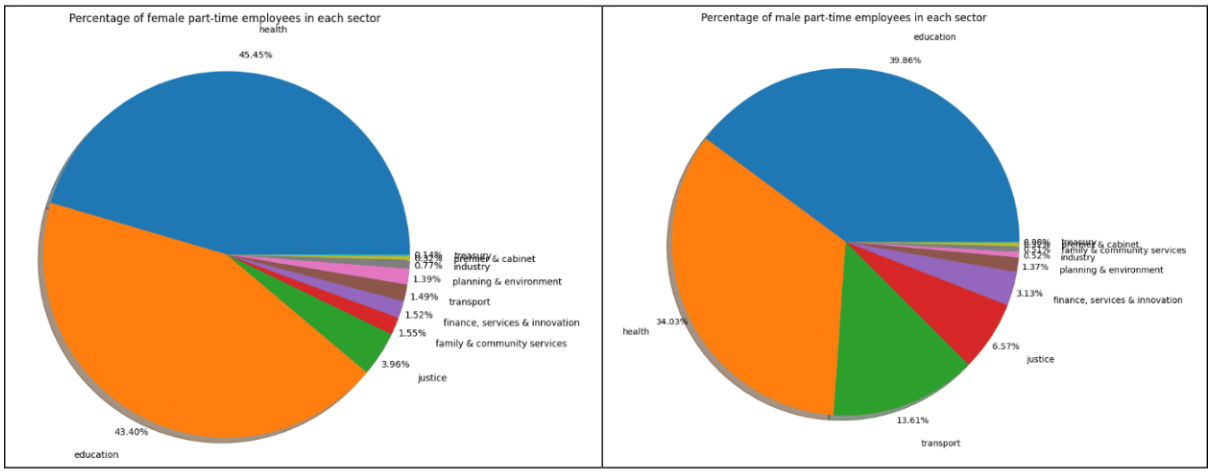
3. The current representation of male and female part time employees as a proportion of the respective male and the female workforce in the sector and in each cluster

We plotted bar graphs to display the headcounts of part-time male and female employees, as well as the total number of part-time employees in each cluster in 2018. Again, the Health and Education clusters have the highest representation of part-time employees.



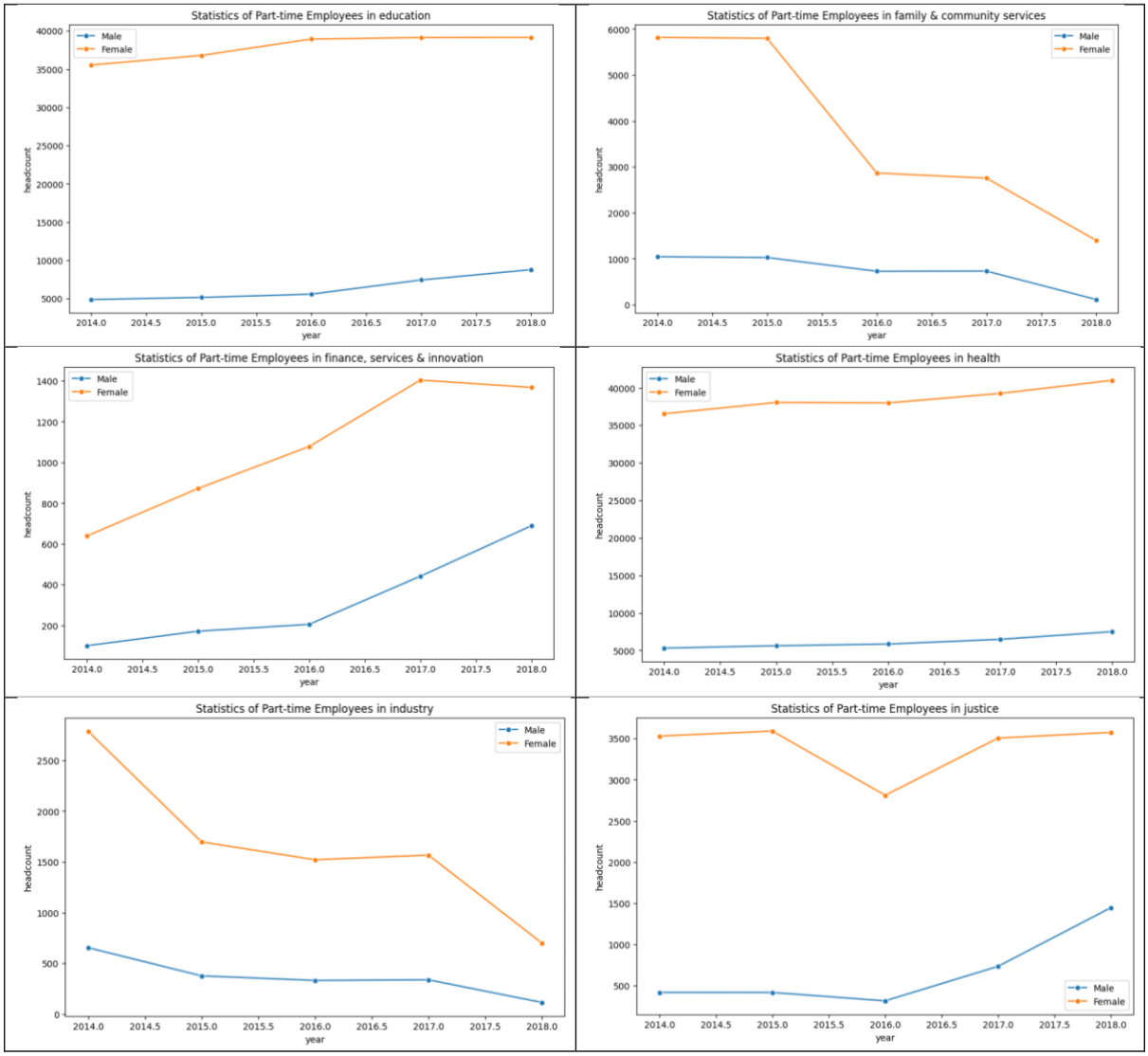


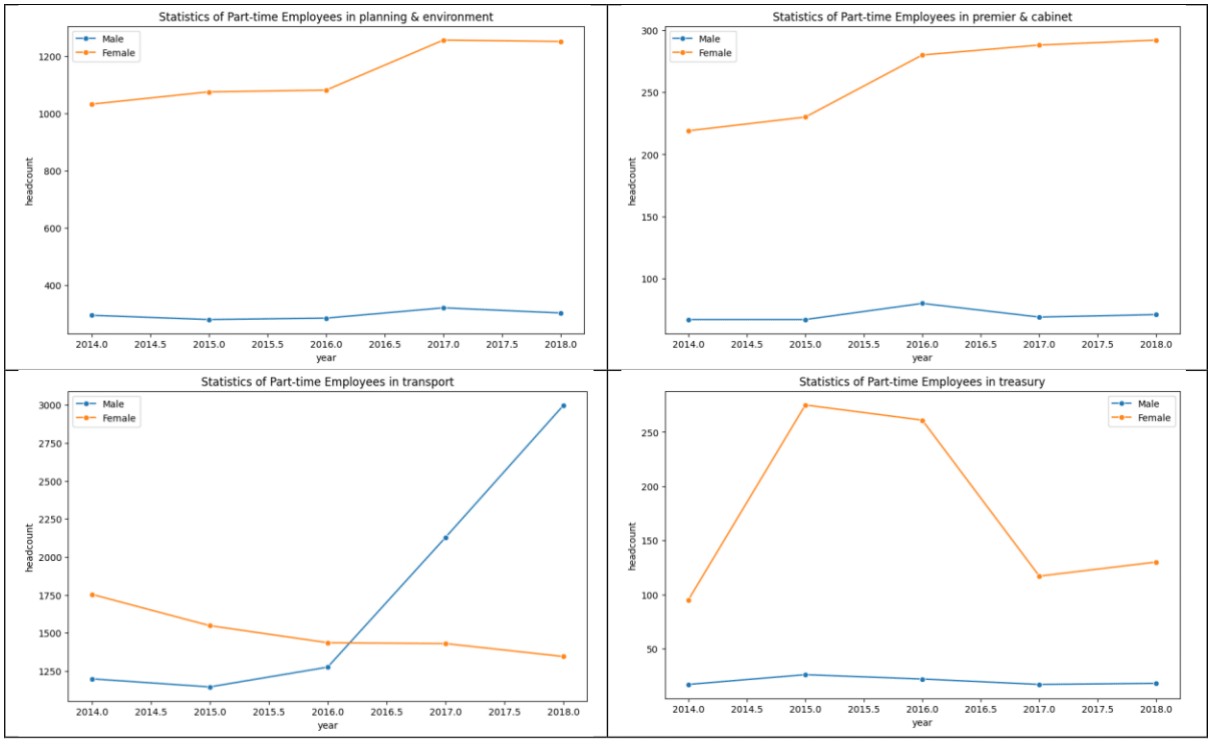
Furthermore, two pie charts have been plotted to represent the percentage distribution of part-time male and female employees in each sector, using pie slices for visual clarity.



4. Change in these two above statistics over the last 4 years

The plots represent the trends of part-time male and female employee headcounts in ten different sectors over the years. These trends highlight the evolution of gender representation in part-time roles within each sector over time.

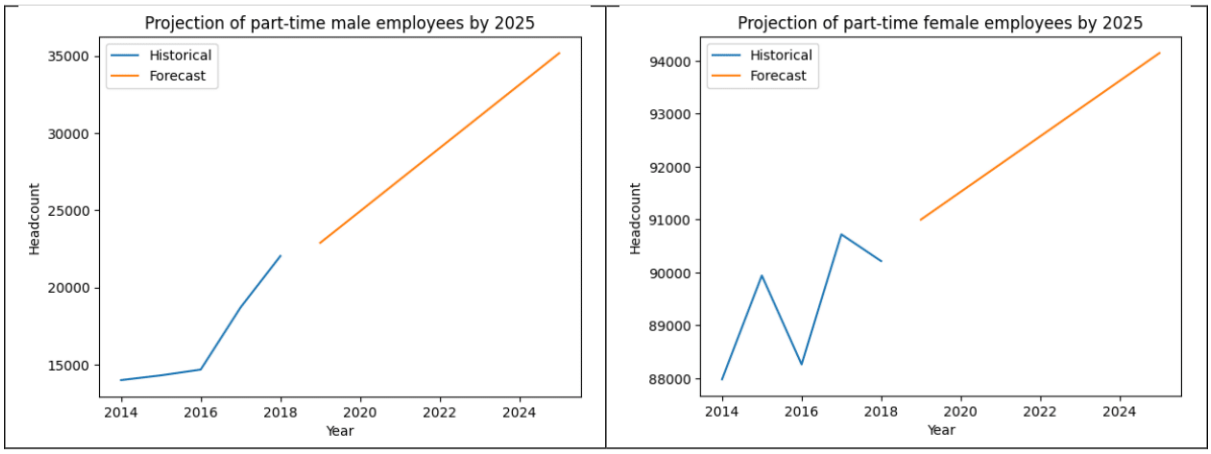




5. Projection of what the representation will be by 2025 if the current trends continue

We used Python's sklearn library and implemented a simple linear regression model to predict the number of part-time male and female employees in future years. The model was trained on historical data, with 'year' as the independent variable and 'headcount' as the dependent variable. The trained model was then used to predict the 'headcount' for future years.

In terms of the parameters in this model, this code uses the default parameters as it does not specify any when creating the model instance. The default parameters include fitting an intercept (i.e., fit_intercept=True), not normalizing the regressors (i.e., normalize=False), and using the ordinary least squares method to compute the coefficients.



Both predictions show an increasing trend, reaching a total of 35,000 and 94,000 for male and female employees, respectively. Please note that this naive prediction did not consider any external factors such as the COVID-19 pandemic or geolocation events, economic circumstances, and other potential influencers.

OVERALL CONCLUSION AND RECOMMENDATIONS

The analysis reveals a growing trend of part-time employment within the NSW public sector, particularly among females. The projections suggest a continuing rise in part-time roles by 2025. Given these insights, we recommend ongoing data monitoring and policy development to address the evolving workforce dynamic. Furthermore, initiatives to support part-time employees and tackle their unique challenges could enhance workforce diversity and inclusivity.