

# PATHWAYS FOR CAREER TRANSITION



ANLY645 PROJECT  
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According to *LinkedIn Talent Blog*, more than half of recruiters who have left the field made a transition into a different HR role, making it the most popular function by far. Sales and business development are also popular landing spots.



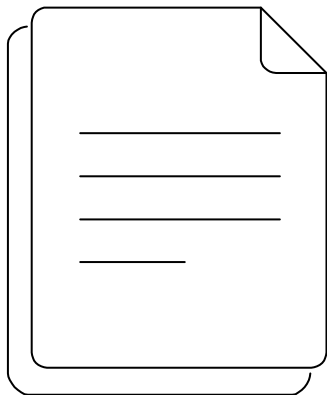
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# Data Preprocessing



## Career Pathways Descriptive and Analytical Study Data



338 variables  
46789 observations



- Starting occupations code
- Starting sector
- Ending occupations code
- Ending sector
- Education at start
- Education at end
- Wage change
- Career transition path
- Importance of skills



keep the latest  
records for each  
respondent

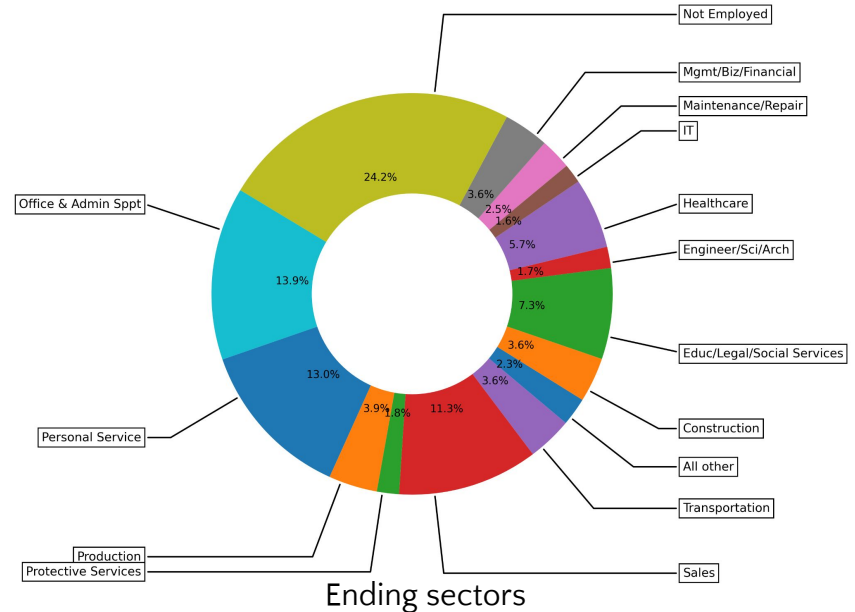
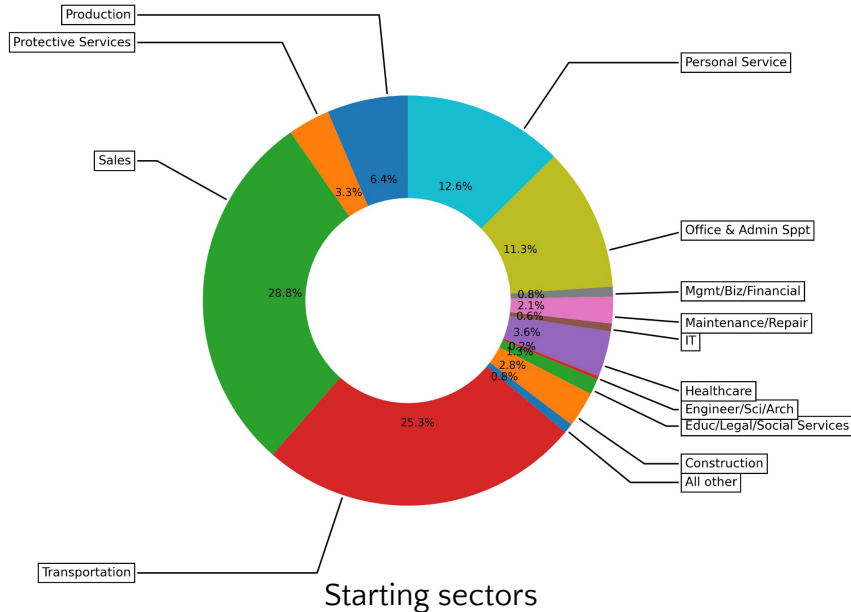


## General Information

20.07% of respondents succeeded in pursuing educational background exaltation.

The percentage of people who succeeded in getting a raise is 54.77%.

The percentage of people who improved educational background and getting a raise is 59.61%.



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# Network Analysis

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- 📄 Nodes: occupations
- 📄 Edges: existence of transitions
- 📄 Edge attribute:

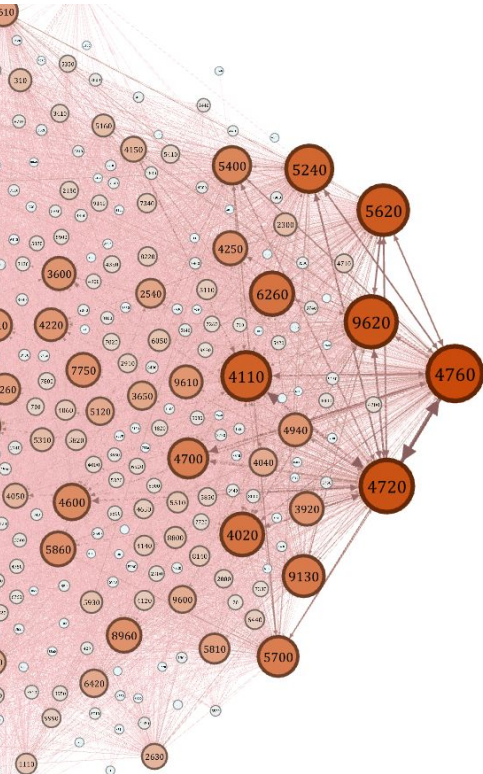
weight = the total number of transitions between nodes

Number of nodes	Number of edges	Density	Average Clustering Coefficient	Degree Assortativity Coefficient
472	8370	0.038	0.368	-0.214

**Note:** Edge width is proportional to edge weight. Edge distance has no relationship to any edge attributes.



# Centrality



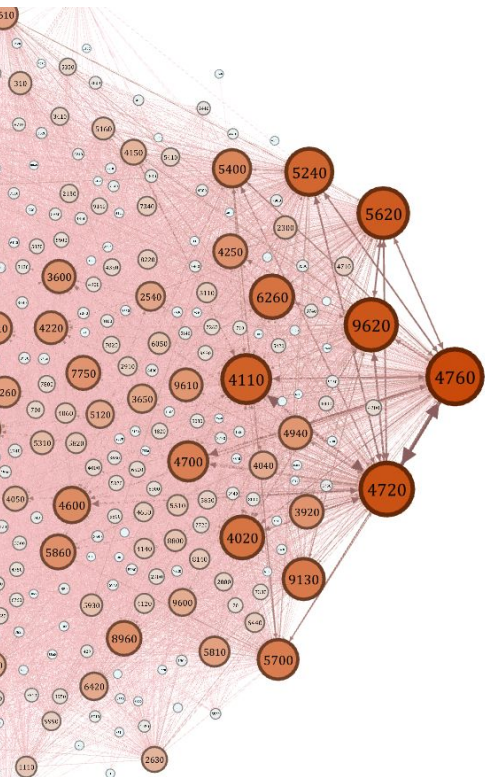
	In-degree	Out-degree	Closeness (inward)	Closeness (outward)	Betweenness	Eigenvector
1	Retail salespersons (4760)	Laborers and freight, stock, and material movers, hand (9620)	Retail salespersons (4760)	Laborers and freight, stock, and material movers, hand (9620)	Retail salespersons (4760)	Cashiers (4720)
2	Cashiers (4720)	Retail salespersons (4760)	Cashiers (4720)	Retail salespersons (4760)	Laborers and freight, stock, and material movers, hand (9620)	Waiters and waitresses (4110)
3	Waiters and waitresses (4110)	Cashiers (4720)	Waiters and waitresses (4110)	Cashiers (4720)	Waiters and waitresses (4110)	Retail salespersons (4760)
4	Stock clerks and order fillers (5620)	Driver/sales workers and truck drivers (9130)	Customer service representatives (5240)	Driver/sales workers and truck drivers (9130)	Stock clerks and order fillers (5620)	Receptionists and information clerks (5400)
5	Customer service representatives (5240)	Waiters and waitresses (4110)	Stock clerks and order fillers (5620)	Waiters and waitresses (4110)	Cashiers (4720)	Customer service representatives (5240)





# Turnover rate

$$TR = \text{sum}(\text{weights of all out-edges}) / \text{sum}(\text{weights of all in-edges})$$



Highest outflow occupation

Occupation	Turnover
Dredge, excavating, and loading machine operators	8.5
Other transportation workers	6
Parking lot attendants	5.72
Machine feeders and offbearers	5.5
Tool and die makers	5

Highest inflow occupation

Occupation	Turnover
Computer and information systems managers	0.048
Lawyers	0.071
Medical and health services managers	0.111
Architects, except naval	0.111
Human resources managers	0.118

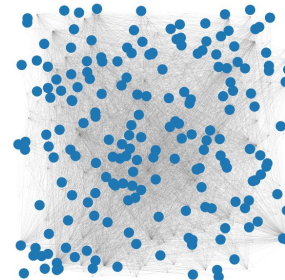
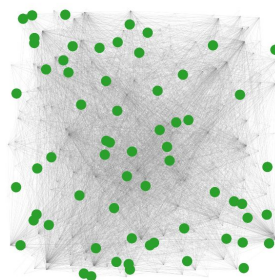
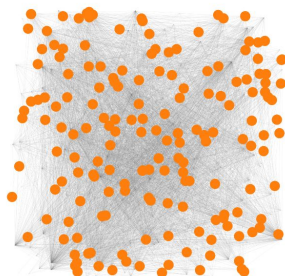


# Community detection

Greedy algorithm  
Modularity = 0.2136

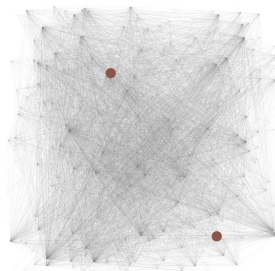
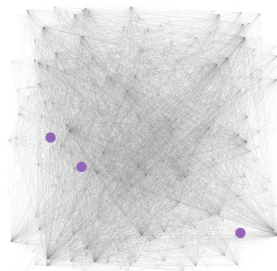
Office & Administrative Support  
Personal Service

Construction

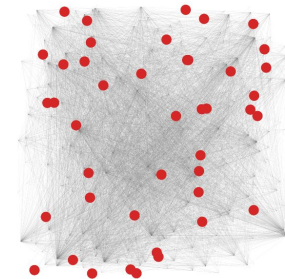


Production

Transportation



Production



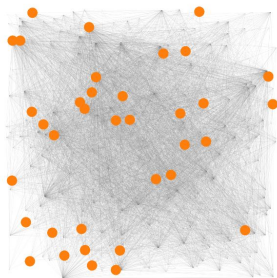
Healthcare



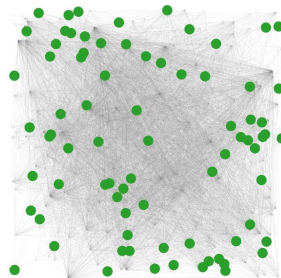
## K-means based on skill importance

Normalized Mutual  
Information (NMI) =  
0.2197996822892952

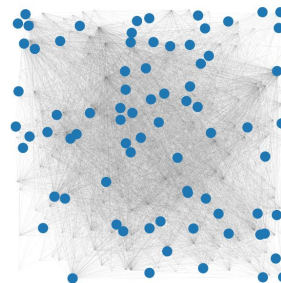
Transportation



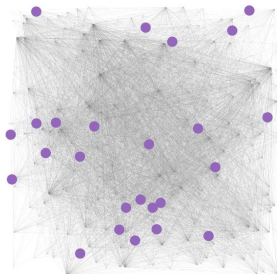
Sales



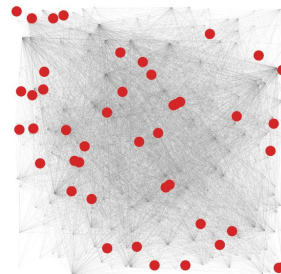
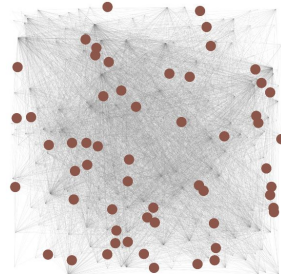
Personal Service



Production



Construction



Office & Administrative Support

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# Discussion

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## Discussion

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- Transportation industry has the majority of occupations that have high outflow rate. Some occupations requiring scientific or professional qualifications have the highest inflow rate.
- None of the occupations show significant features that would help with career transitions.
- The core of the network
- Skills influence career change to some extent, but there are other factors as well.



## References

- [1] The Most Common Career Transitions for Recruiters | LinkedIn. (n.d.). <https://www.linkedin.com/business/talent/blog/talent-strategy/most-common-career-transitions-for-recruiters>
- [2] Wikipedia contributors. (2023). Career. Wikipedia. <https://en.wikipedia.org/wiki/Career>
- [3] Xu, H., Yu, Z., Xiong, H., Guo, B., & Zhu, H. (2015). Learning Career Mobility and Human Activity Patterns for Job Change Analysis. 2015 IEEE International Conference on Data Mining, 1057–1062. <https://doi.org/10.1109/ICDM.2015.122>
- [4] Clochard, A. (2022). Using Network Analysis of Job Transitions to Inform Career Advice [PhD Thesis]. Massachusetts Institute of Technology.
- [5] Cheng, S., & Park, B. (2020). Flows and boundaries: A network approach to studying occupational mobility in the labor market. *American Journal of Sociology*, 126(3), 577–631.
- [6] Career Pathways Descriptive and Analytical Study Data. (n.d.). DOL. <https://www.dol.gov/agencies/oasp/evaluation/data-repo/career-pathways-da-data#apdu-5>



# Thanks!

*Any questions ?*