

## Quantifying Highly Influential Director using Network Centrality Analysis

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### Background and Motivation

In the current field of leadership/directorship research, there has been insufficient effort to compare the influence of directors within an industry. This is due to the subjectivity in the definition of influence as researchers have yet to quantify influence. Researchers have focused on measuring influence of directors on various aspects of the business where influence is dependent on corporate governance. With the lack of a basic measurement, this study proposes a methodology to quantify influential directors within an industry.

To find the most suitable influence measures, we have explored the different definitions of influence using literature review, whilst identifying some key characteristics and traits of influential directors. In better identifying influential directors, the use of case studies and real-life examples are introduced to understand the implication of influential directors on business. Followed by the literature review on networks and influence, we conducted a network analysis using centrality measures to determine a comparable director score within any specific industry to quantify influence.

### Data and Methods

This project data comes from open-source director database that is Companies House and the Data

City. After some data cleaning and feature engineering, we used Neo4j to create a director network and then calculating centrality (Betweenness centrality, Eigenvector centrality, Closeness centrality and Degree centrality) of each director using Neo4j's algorithm. Once centrality scores were generated for each director, we computer the values into an average whilst adding further weighting into each director score to increase the score's representation within its industry.

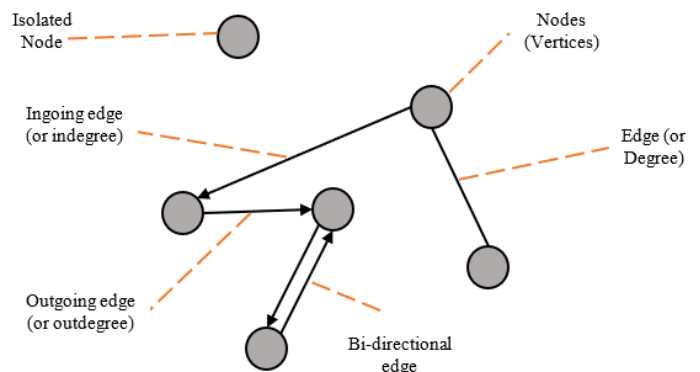
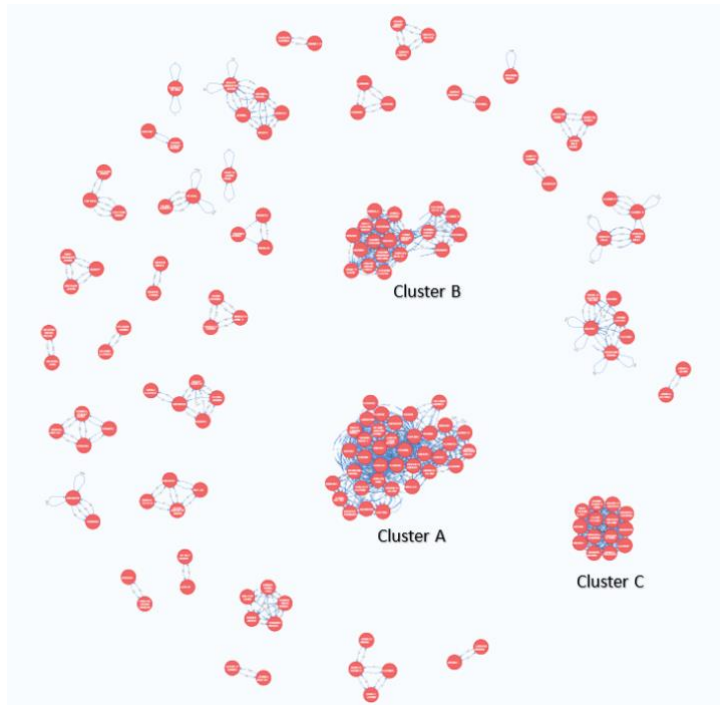


Figure 1 Network Example and Components

### Key Findings

Based on the data on UK companies, we have built a network containing 159 unique directors (nodes) and 1148 relationships (edges) amongst them. The network was able to identify three clusters of sub-networks representing larger organisations. The results suggest a consistent list of highly influential directors; however, further analysis indicates that each centrality measures represents different aspect of influence. The results have provided an insight into quantifying the influence of directors. The research finds a multiple possible

interpretations of influence.



*Figure 2 Result: Director Network*

### Value of the research

Throughout this study, we have demonstrated the effectiveness of the research's methodology to generate better insights from a static dataset. This research has contributed towards creating a replicable methodology for a UK-based director network using simple directors' information such as previous employment and tenure. This further highlights the capability of the methodology in providing valuable insight to most influential directors within any industry. We conclude that the proposed measures are highly flexible and replicable regardless of any industry. For further analysis, we recommend enrichment of variables to improve the quantification of influence.