An Explicative and Predictive Study of Employee Attrition

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Abstract

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1. Introduction

Building and maintaining a stable, productive, collaborative, and high-quality workforce is a primary concern for the majority of managing principals as success in this area tends to be a key factor contributing the overall firm prosperity [CITATIONS??]. Inevitably, all firms will experience employee attrition. Involuntary attrition is often the result of profitability and performance pressures, department or business line obsolescence, and mergers and acquisitions, among other factors [CITATIONS??]. In contrast, voluntary attrition is driven predominately by employee concerns [CITATIONS]. Such considerations my focussed around, but not limited to, managerial direction, compensation and benefits, firm culture, firm desirability and location, promotion potential as well as non firm specific motivations, e.g. medical conditions or retirement.

A central objective of the majority of human resource departments is to understand the root causes behind voluntary employee attrition and develop an associated mitigation strategy. Effectively navigating such issues generally resulted in explicit positive monetary effects stemming from increased firm revenue and cost reductions manifested through the work retained highly performant employees. In addition, identifying and resolving issues found to be common to employee attrition often implicitly enhances firm culture and workplace desirably which in turn enables the recruitment of higher quality staff which further improve retention, firm operation, and business practices. We feel that the compounding effect nature of this employee attrition feedback loop on the overall success or failure of the firm is the essential motive for conducting a through investigation into this matter. [MORE CITATIONS FOR THIS PARAGRAPH]

Traditionally, employee attrition and retention issues tend to examined through qualitative and anecdotal measures. Specifically, human resources staff tend to conduct exit interviews after an employee provides a resignation notice in order to ascertain the motivations behind the decision to leave. Although these conversations may be direct and candid, i.e. in the event an employee is leaving for a significantly more senior role or needs to change geographic location for family reasons, in actuality, human resources staff encounter considerable difficulty discerning the employee's actual rationale. By way of example, employees seldom offer negative criticism of management during exit interviews for fear of future personal retribution or inadvertent retaliation towards their close colleagues who will still remain at the firm. These circumstances impact the employee attrition data aggregation and quality assurance process by making it cumbersome, at a minimum, which leads to additional difficulties determining which attrition issues should be of primary importance for management to resolve. In addition, employee attrition data is typically high confidential and only accessible to key stakeholders internally within a firm. This fact has been a major impediment for the progression of academic research on this topic. [CITATIONS]

Recently, internet based platforms such as GlassDoor and LinkedIn oriented towards working professionals have amassed large quantities of publicly available information related to individual employee resumes including employment history, frank reviews of firm culture, desirability, and management as well as anonymous feedback. Although this data often lacks attritional motivation information at the individual employee level, when combined with aggregate firm culture and management rankings, one may glean a number of insights into the collective behavior and motivations behind individual decisions to transition to a new employer. Our major aim is precisely in this vein. More specifically, we conduct a quantitative data analysis of employee attrition motivations as

well as develop predictive models that will enable human resources staff identify employees whose firm separation may be imminent.

We extend the work of [1] who examine employee attrition and retention issues based upon a collection of approximately five thousand anonymously submitted resumes to Glassdoor. We provide SUMMARY OF DATA ANLAYSIS EXTENSIONS. In addition, SUMMARY OF NEW MODELS. Lastly, we delineate future data acquisition, analysis and model development extensions that we seek to investigate in future work.

This article is organized as follows ... TYPE WHEN FINISHED

2. Data Description and Feature Engineering

We first turn to describing the content extracted from a collection of employee resumes that will form the basis for the subsequent attrition studies. Next, we provide a variety of summary statistics of this information that are relevant for the design of latter predictive models. Then we discuss our data normalization process and several features constructed from this original data which will be utilized as input into these models. In addition, we outline limitations of this dataset and ideas for improvement in future work.

2.1. Data Source Description

We worked in conjunction with the authors of [1] to obtain a collection of 5550 examples of employee job transitions between 2007 and 2016 which were sourced from an extensive proprietary database of resumes shared anonymously though Glassdoor's platform. A job transition is define to be any instance of an employee listing a new role on their resume which may be associated with the present or original or a new employer designated as internal and external moves. Internal moves are typically significant in the sense of the employee either changing roles or being promoted within an organization as opposed to being reassigned within a current team. External moves are of interest for our attrition studies as in this situation employees leave their original firm entirely. We summarize several salient features of the dataset construction process and expound upon details relevant to model development below; we refer the reader to [1] for a complete description of the data source.

2.2. Summary Statistics and Feature Engineering

3. Exploratory Insights

Sum.

3.1. Idea 1

3.2. Idea 2

4. Towards an Attrition Model

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4.1. Linear Review

4.2. Logistic Work

4.3. Binary Classifier

4.4. Model Performance Comparison

5. Conclusions and Extensions

Here we describe several ideas to pursue as part of this study

Mention limitations here (same as in glassdoor article and others that we find) ... then mention that our extensions will overcome these limitations

– company specific analytics – linkedin, full glassdoor dataset – outlier determination may serve as a glassdoor fake review filter

References

[1] M. Smart and A. Chamberlain, "Why do workers quit? the factors that predict employee turnover.," *Glassdoor Research Report Whitepaper*, pp. 1–19, 2016.