Analysis of Employee Reviews from Top Tech Companies

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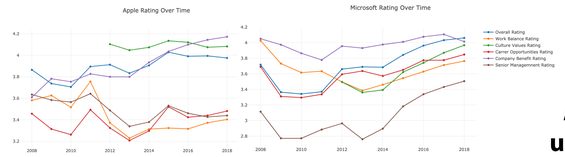
COS424 – Final Project

ABSTRACT

- Glassdoor.com is a great resource for people looking to decide where to apply for their next job
- However, there is too much data to peruse manually to determine which company is the best fit
- Machine learning techniques can be used to process past reviews and determine how well each company matches up with a specific person's needs and concerns
- We use natural language processing (NLP) techniques to extract concerns of current or past employees from their reviews in combination with the employees' satisfaction to characterize each of the six top tech companies: Facebook, Apple, Amazon, Microsoft, Google, and Netflix
- We propose an algorithm for matching prospective employees to the company that best addresses his/her concerns

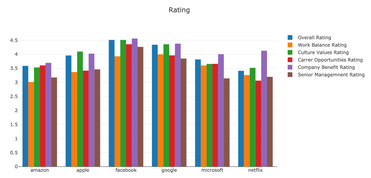
BACKGROUND AND DATA

Observing trends of each company over time leads to some interesting correlations between certain events occurring and the employees' opinions



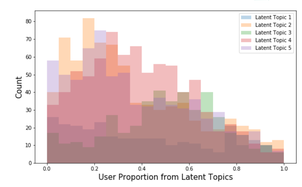
Steve Jobs passes away in October of 2011 and we see a clear drop in multiple ratings

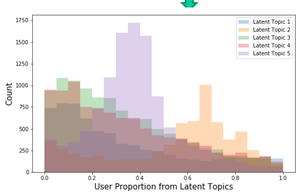
Microsoft announces a new CEO in February of 2014 and we see a clear rise in senior management rating

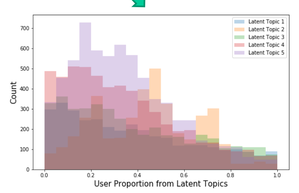


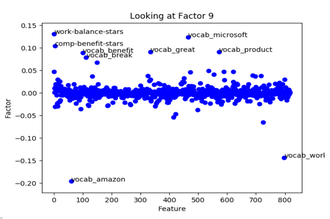
After filtering out invalid or unanswered response, we can naively say that Facebook is the best company to work for and Netflix is the worst

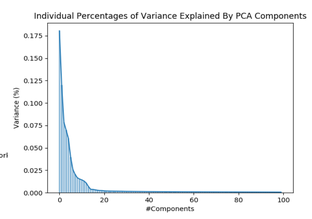
company	location	dates	job-title	summary	pros	cons	advice-to-mgmt	overall-ratings	work-balance-stars	culture-values-stars	carrer-opportunities-stars	comp-benefit-stars	senior-management-stars	helpful-count
apple	none	Dec 11, 2018	Current Employee - Anonymous Employee	Best Company to work for	People are smart and friendly	Bureaucracy is slowing things down	none	5	4	5	5	4	5	0
microsoft	none	Jun 21, 2013	Former Employee - Program Manager	Moving at the speed of light, burn out is inevitable...	1) Food, food, food. 15+ cafes ...	1) Work/life balance. What balance? All those perks ...	Don't dismiss emotional intelligence and ...	4	2	3	3	5	3	2094
google	New York, NY	May 10, 2014	Current Employee - Software Engineer III	Great balance between big-company security ...	* If you're a software engineer, you're ...	* It *is* becoming larger, and with it comes growing pains ...	Keep the focus on the user. Everything else will follow.	5	5	4	5	5	4	949

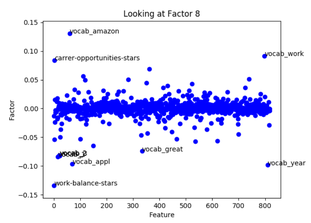








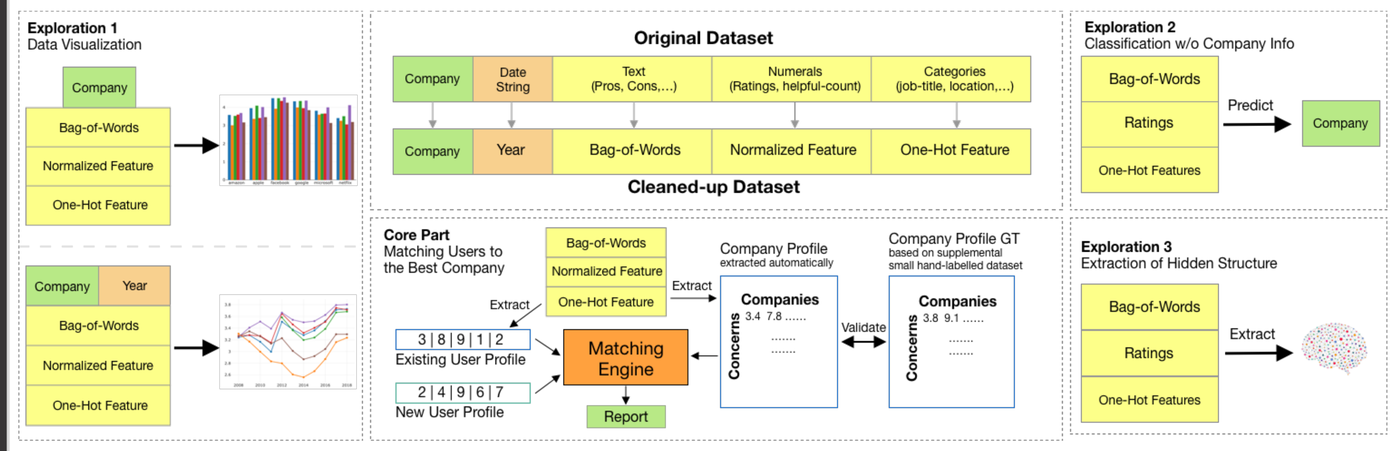




We extrapolated five "latent users" for each company using PCA; used factor analysis to see how each feature contributes to the factors; these analyses are further combined manually with five concerns -

People/coworkers/environment; Food/perks/amenities; Salary/promotions/climbing; Schedule/vacation/flexibility; Workload/challenge/impact

EXPLORATIONS



MODEL REPORT

Generate paragraph from template matching user to best fit based on importance of concerns by user and each company trained on manually labelled concerns

User 1 concerns:
1. Food
2. Salary
3. Work-life balance

The company that best matches you is _____. It seems like you were most concerned about _____ (and/or _____). _____ has the best rating for your concerns based on past employee reviews. (_____ may also be a good match for you although they have a lower rating in _____).

Company	People/coworkers/ environment	Food/perks/ amenities	Salary/promotions /climbing	Schedule/vacation/flexibility	Workload/challenge/impact
Google	5	4	3	1	2
Amazon	5	3	2	1	4
Facebook	5	4	1	2	3
Netflix	2	5	1	3	4
Apple	5	3	1	2	4
Microsoft	5	2	1	3	4

Company	People/coworkers/ environment	Food/perks/ amenities	Salary/promotions /climbing	Schedule/vacation/flexibility	Workload/challenge/impact
Google	5	4	3	2	1
Amazon	3	4	5	2	1
Facebook	5	4	2	1	3
Netflix	4	5	3	2	1
Apple	4	5	2	1	3
Microsoft	5	4	2	3	1

The company that best matches you is Google. It seems like you were most concerned about food and salary. Google has the best rating for your concerns based on past employee reviews. Facebook may also be a good match for you although they have a lower rating in work-life balance.

These tables were obtained using two different methods: the values in the first table were calculated based on 200 manually labelled concerns from random employee reviews, and the second was obtained by PCA analysis on the Bag of Words of the text data coupled with polarity(sentiment) analysis. The topics from PCA are used to get the top vocabulary which matches with the set of concerns we have built manually.

RESULTS & CONCLUSION

- Although not the main goal of this project, using a supervised learning model on our latent feature space with PCA gave us a 44% accuracy on predicting which company an employee writing a review worked for
- Performing PCA on individual companies generated latent variables on the employees who worked at each company (e.g. Apple → health, Amazon → pay)
- At the time of this writing, we do not have results for the accuracy of our report generator; please refer to our report for more accurate data
- Possible extensions to our project:
  - Extract the concerns of employees from their reviews and match them to the best fitting company
  - Find similarities between companies and determine how similar the working experience is

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