



---

## **HR Analytical Tool to mitigate employee turnover**

February 2023



# The Team



# The Problem: Employee turnover

The company's most important asset is its workforce; measuring and tracking employee turnover is essential to identify employee satisfaction

## Costs of employee turnover



### Productivity

Loss of human capital, operational disruption, increase workload, negative image of the company...



### Money

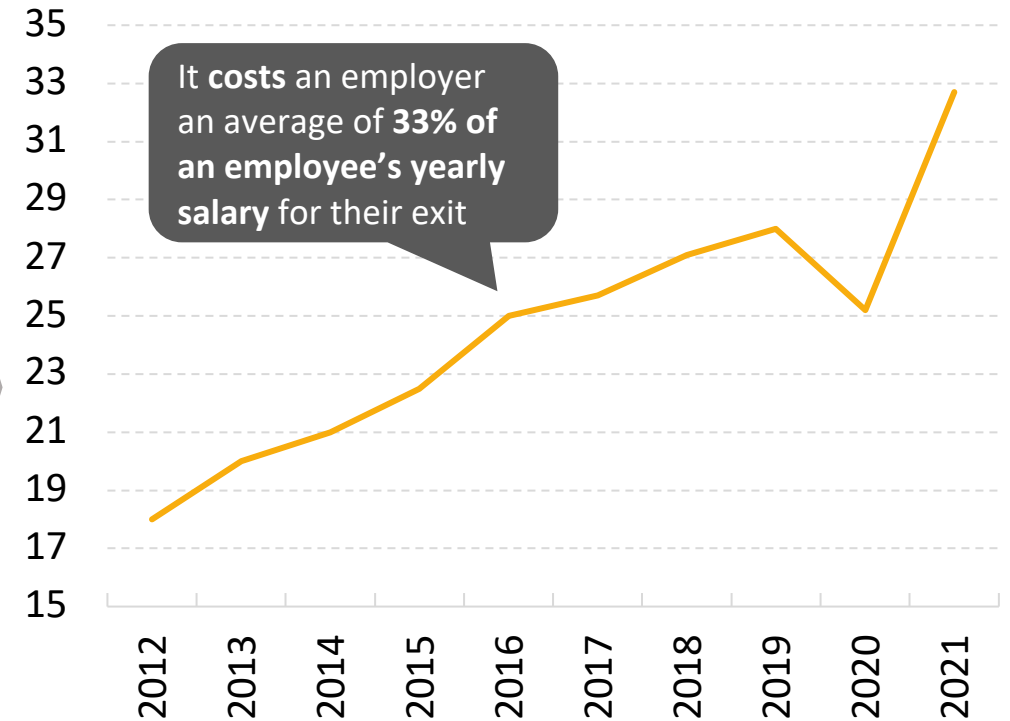
Replacement and recruiting costs include advertising, interviewing, selection and placement costs...



### Time

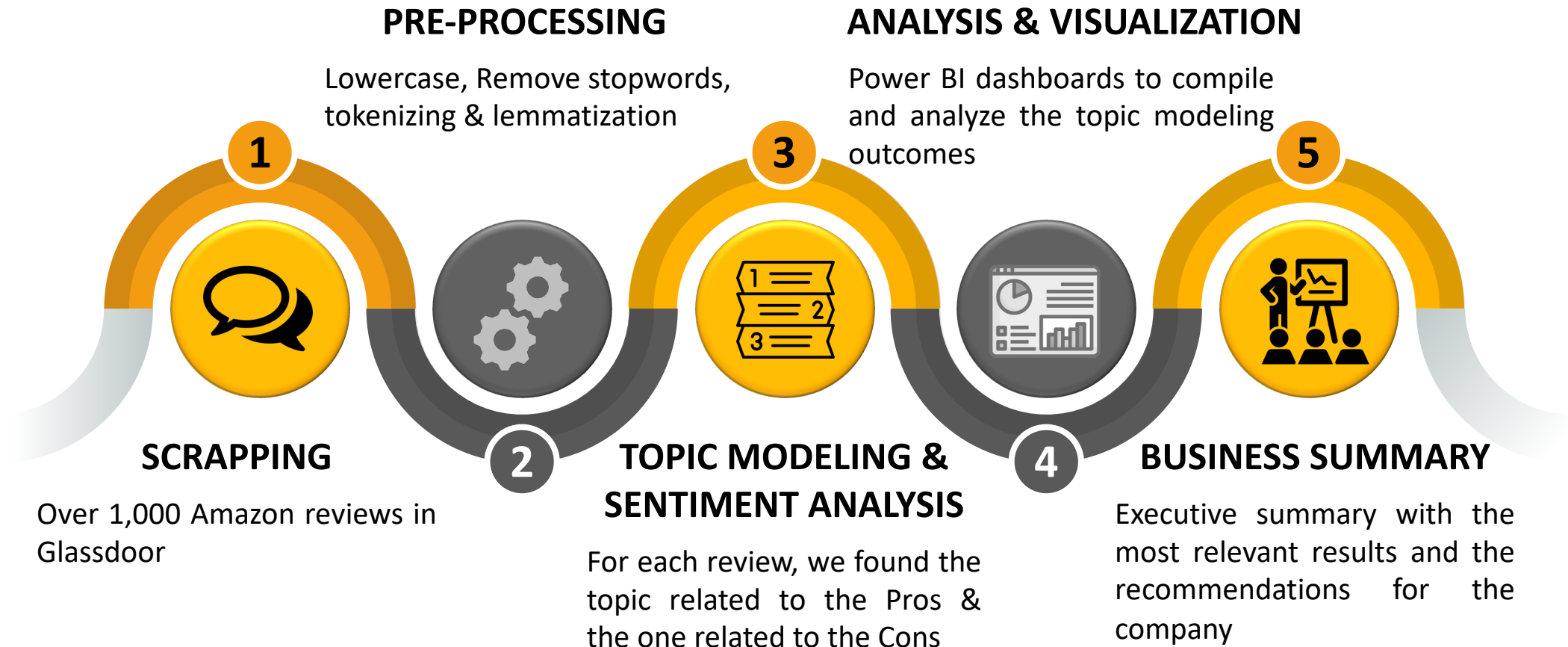
Training time, orientational costs, recruiting time...

## Attrition rate in United States



# The Solution: HR Analytical Tool

The Team developed an analytical tool to analyze Amazon employee reviews from Glassdoor to make recommendations to minimize the employee turnover. This tool can be adapted to other companies

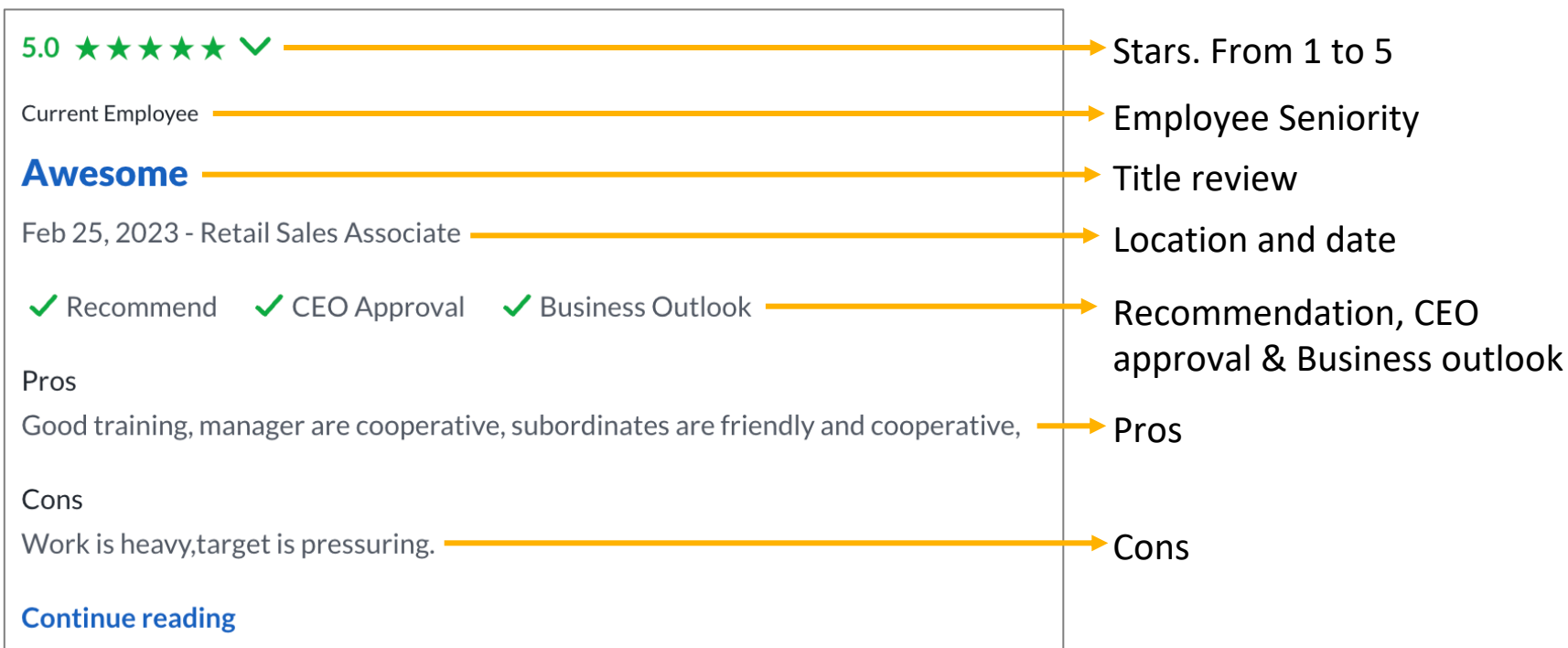




# Scrapping and Pre-processing

The Team started scrapping and pre-processing more than 1,000 Amazon reviews in Glassdoor to analyze multiple attributes

## Scrapping & Pre-processing



### Pre-processing steps

1. Lowercase
2. Remove stopwords
3. Tokenizing
4. Lemmatization



# Sentiment Analysis

For Sentiment Analysis, the data had to be pre-processed in a different way. After that, each review was categorized into positive, neutral or negative using vaderSentiment

## 1 Estimate Compound Scores

- For each review, the compound score was calculated for Pros and Cons (-1 extreme negative and 1 extreme positive)
- The average compound was calculated to determine the sentiment

	pros_comp	cons_comp	avg_comp
0	0.5994	0.2541	0.42675
1	0.4215	-0.4404	-0.00945
2	0.8481	0.0000	0.42405
3	0.8750	0.7003	0.78765
4	0.3818	0.7650	0.57340

## 2 Assign Sentiment category

Based on the avg\_comp, we categorize the reviews in:

- Positive: above 0.1
- Neutral: between -0.1 and 0.1
- Negative: below -0.1

	avg_sent	pros_sent	cons_sent
0	positive	positive	positive
1	neutral	positive	negative
2	positive	positive	neutral
3	positive	positive	positive
4	positive	positive	positive



**Positive**



**Neutral**



**Negative**



# Topic Modeling

For Topic Modeling, the Team used the pre-processed reviews dataset and found the number and characteristics of topics in the Pros and Cons comments using LDA method

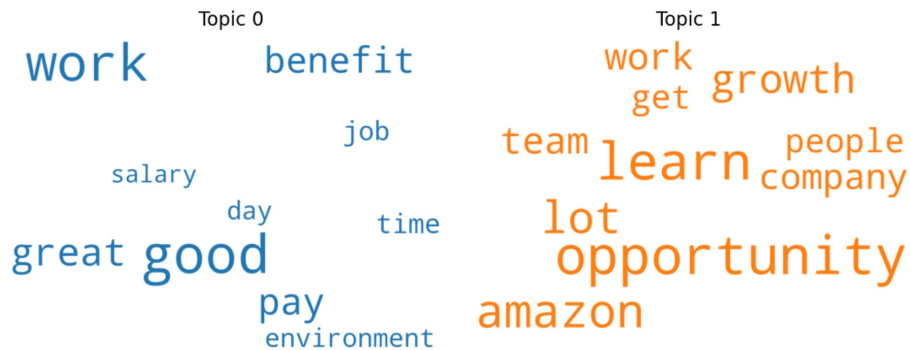
## Pros comments



Using the topic coherence on Pros comments, the Team found that exist **2** underlying topics in it:

Topic 0. Related to **salaries and benefits**

Topic 1. Related to **opportunities, learn and growth**



## Cons comments

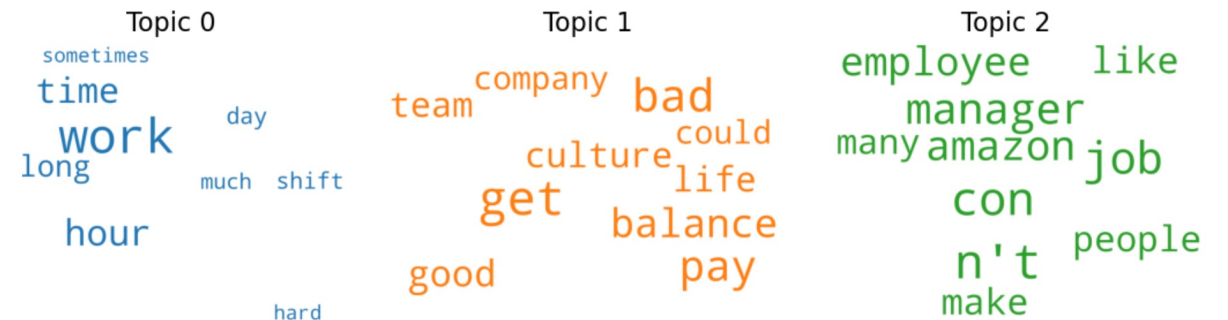


Using the topic coherence on Cons comments, the Team found that exist **3** underlying topics in it:

Topic 0. Related to **work and time**

Topic 1. Related to **culture and balance**

Topic 2. Related to **people and manager**





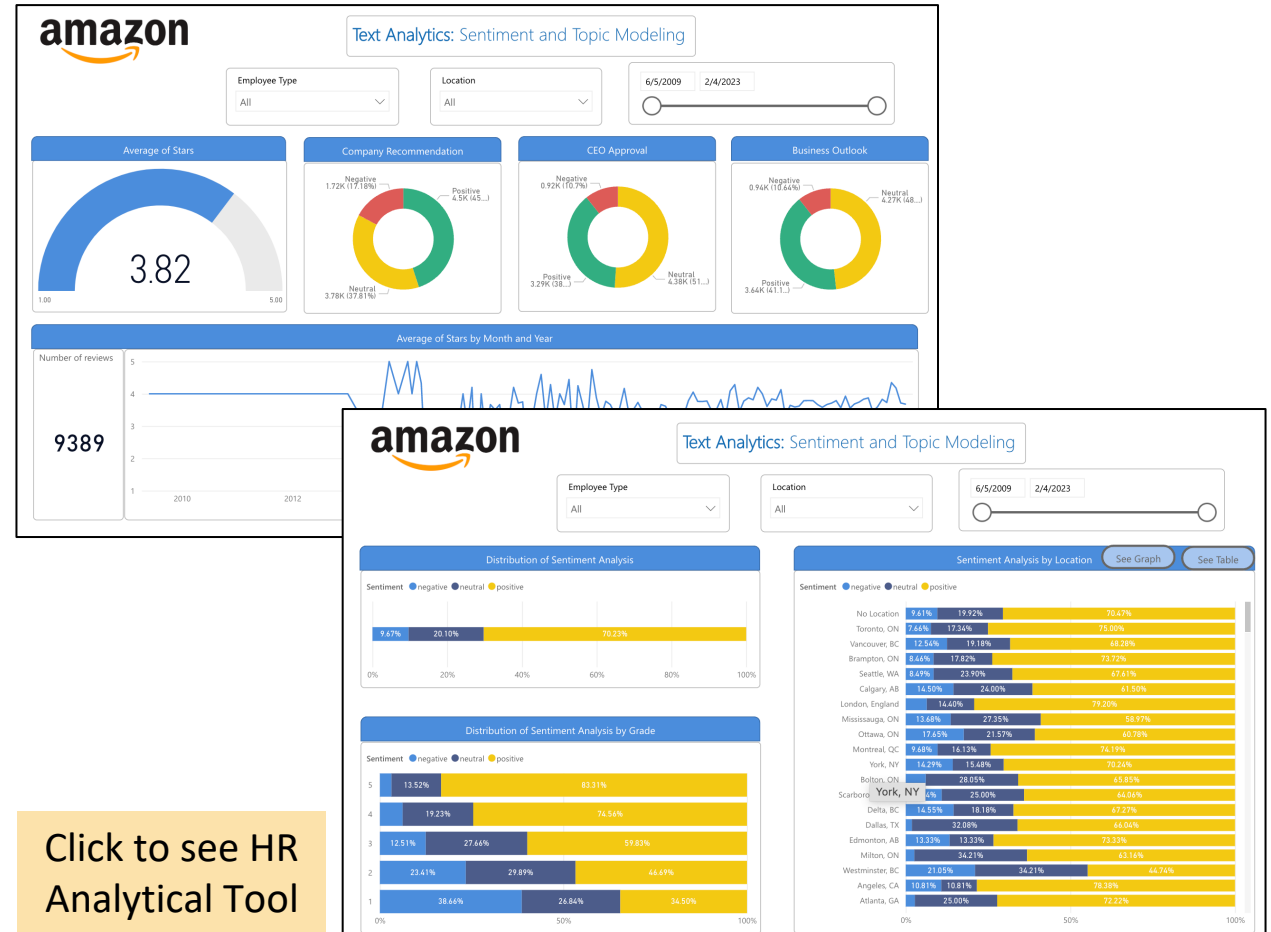


# Analysis & Visualization

The team created dashboards in Power BI to analyze, visualize and compile the main results

The HR Analytical Tool can provide relevant insights from Glassdoor reviews and allow the user:

- Filter and **display information about a specific timeframe, employee type, and location**
- Visualize the **trend and historical performance of Stars by month and year since 2010**
- **Identify sentiment analysis by location** to understand which regions are doing well and which poorly
- **Observe sentiment analysis by employee seniority**, among many other insights



Click to see HR Analytical Tool





# Business Summary

## Main results from Sentiment Analysis

- From 2018 to 2022, the locations with at least 50 reviews that had the highest and lowest positive reviews were:

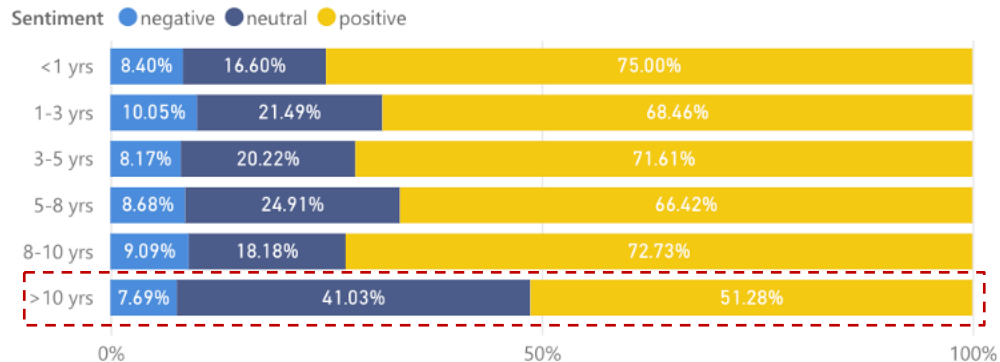
### Best performance

- 1°. London (79%)
- 2° Toronto (74%)
- 3° Montreal (74%)

### Worst performance

- 1°. Ottawa (60%)
- 2° Calgary (61%)
- 3° Scarborough (64%)

- The proportion of positive reviews from **employees with more than 10 years in Amazon barely reach 51%**



## Main results from Topic Modeling

From 2018 to 2022:

- The topics underlying **Pros** comments are mainly related to **Salaries, and Growth & learning**
- The topics underlying **Cons** comments are mainly related to **Work-life balance, and Culture**

### Pros Sentiment



### Cons Sentiment

