

Understanding Resignations: Analyzing Employee Sentiment and Emotions



26 FEBRUARY

Introduction

Day by day, the question of well-being in societies is the subject of much ink and saliva. Companies find themselves in a shortage of employees for reasons that many managers, CEOs and administrative boards are unaware of. Just recently, a medium-sized company with about fifty employees found itself closing down due to the misunderstood resignation of these employees.

Who should be blamed? To the standards and regulations of this company? Certainly to the salaries of the latter? As a Data Science Consultant, I received an email from this company that wants to reopen its doors, but wants to better understand the various reasons for the resignation of its employees.

After a long debate with the Managers and proposals for a way forward, we conclude that a more in-depth analysis will be carried out in order to help the company shed light on its future decision-making.

So I proposed to the company to ***"detect the well-being of employees in the company before their resignation"***, after checking the salary transfers of the latter, the employees warned and many others. Rather, it was to proceed by summoning employees to understand what was not working, until the manager of a team said, and I quote, ***"Employees during certain hours can chat on various forums without superiors interfering or going to check it incognito"***.

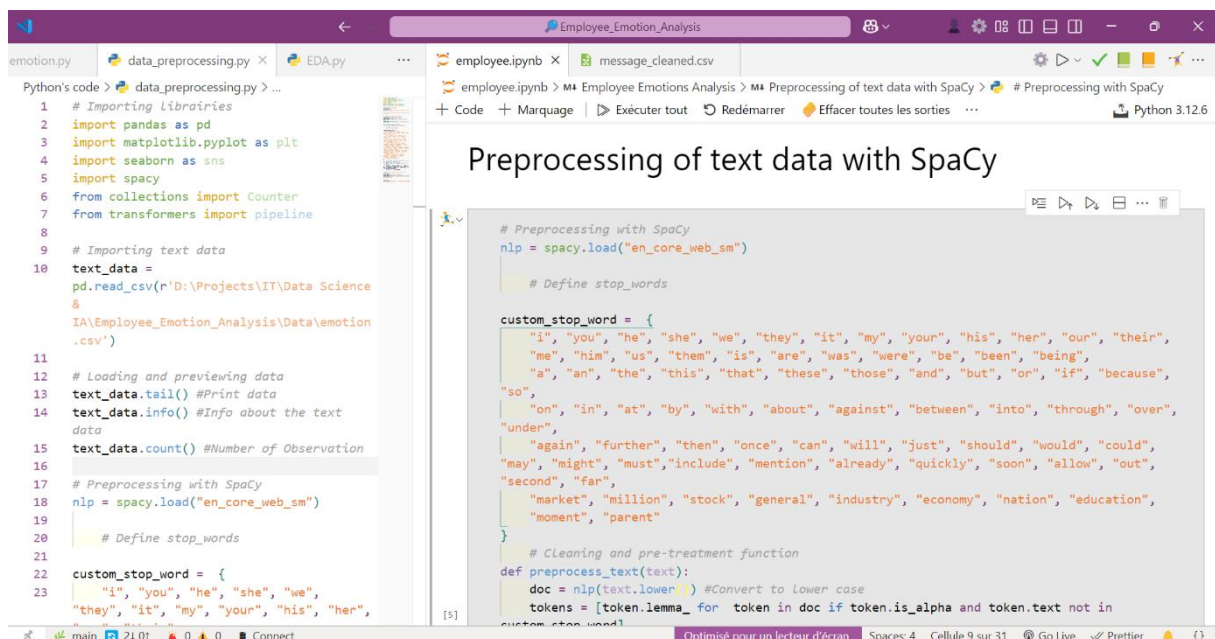
Faced with this textual data and given the company's idea of taking back its employees or it will have to pay compensation, we propose a sentiment and emotion analysis to detect the emotions of employees when they were working.

My objective was therefore to understand the reasons for employee resignation by analyzing their feelings and emotions before their resignation through natural language processing (NLP) techniques, specifically VADER Sentiment and NRClex, powerful tools adapted for this mission. Ultimately, I will propose actionable solutions to re-engage your talent or to avoid this unexpected crisis in the company.

Data pre-processing

"Analysing employees' emotions" is therefore the aim of our study. Thus, the textual data that was sent to me focuses on employee feedback collected on various sources such as Team, Slack, Email. These data include a total of 500 observations from 01/01/2024 to 06/01/2025. To carry out this analysis, we will anonymize employee exchanges in order to keep the exchanges confidential.

The preprocessing of our textual data will focus on converting the data to lowercase and also handling missing values. After converting our data to lowercase, we see that the database has no missing data, which takes the quality of our data one step further. Python's SpaCy library was very useful, as it allowed us to handle tokenization, stop-word removal, and lemmatization.



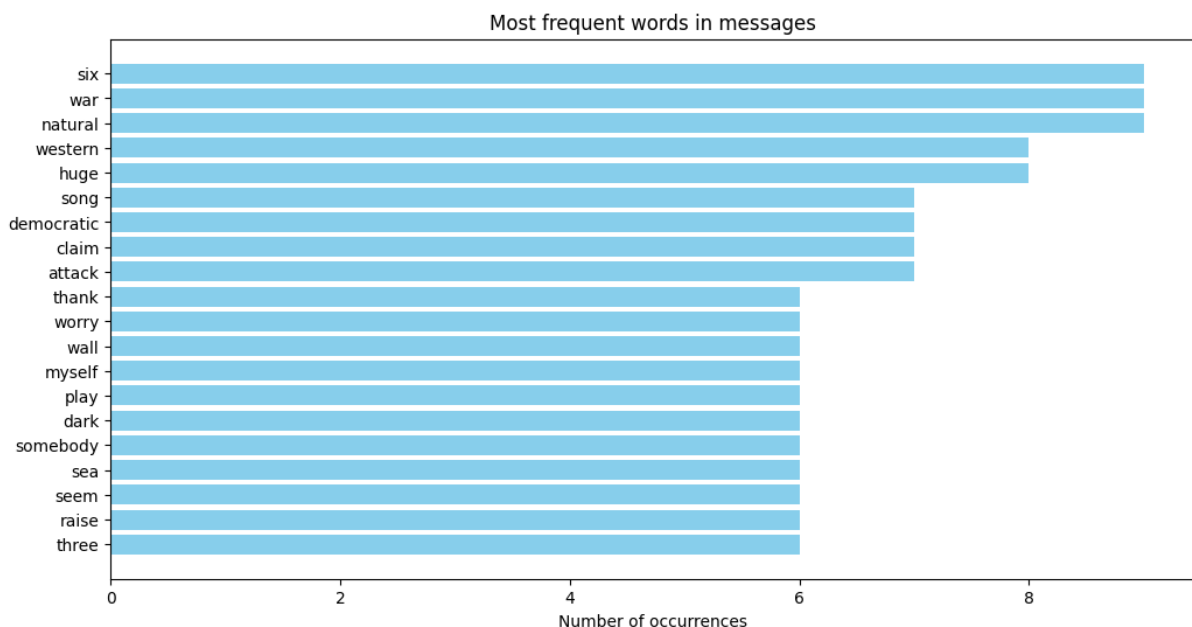
```
Python's code > data_preprocessing.py > ...
1 # Importing Libraries
2 import pandas as pd
3 import matplotlib.pyplot as plt
4 import seaborn as sns
5 import spacy
6 from collections import Counter
7 from transformers import pipeline
8
9 # Importing text data
10 text_data =
11 pd.read_csv(r'D:\Projects\IT\Data Science
12 &
13 IA\Employee_Emotion_Analysis\Data\emotion
14 .csv')
15
16 # Loading and previewing data
17 text_data.tail() #Print data
18 text_data.info() #Info about the text
19 data
20 text_data.count() #Number of Observation
21
22 # Preprocessing with SpaCy
23 nlp = spacy.load("en_core_web_sm")
24
25 # Define stop_words
26
27 custom_stop_word = {
28     "i", "you", "he", "she", "we", "they", "it", "my", "your", "his", "her", "our", "their",
29     "me", "him", "us", "them", "is", "are", "was", "were", "be", "been", "being",
30     "a", "an", "the", "this", "that", "these", "those", "and", "but", "on", "if", "because",
31     "so",
32     "on", "in", "at", "by", "with", "about", "against", "between", "into", "through", "over",
33     "under",
34     "again", "further", "then", "once", "can", "will", "just", "should", "would", "could",
35     "may", "might", "must", "include", "mention", "already", "quickly", "soon", "allow", "out",
36     "second", "far",
37     "market", "million", "stock", "general", "industry", "economy", "nation", "education",
38     "moment", "parent"
39 }
40
41 # Cleaning and pre-treatment function
42 def preprocess_text(text):
43     doc = nlp(text.lower()) #Convert to lower case
44     tokens = [token.lemma_ for token in doc if token.is_alpha and token.text not in
45 custom_stop_word]
```

It should be noted that the pre-processing of the data was of great importance, because, through this, we were able to prepare our database for exploratory analysis of the data and even before training the models to meet our study.

Exploratory data analysis

Word frequencies

Before getting to the heart of our analysis, a visualization of the most frequent words allows us to understand the words that may be related to specific emotions or themes. This realized word frequency shows that words like **"war, attack, worry, dark"** have an emotional and contextually strong connotation. These terms give a first impression of the atmospheres in this company. Of course, this shows that in the company there are discussions around conflicts, worries or concerns.



Even further, words like **"thank, song, natural"** while neutral, show that the tension in this endeavor is still not so negative, but, also include thanks and lighter references.

This frequency of words made it possible to understand that certain words are closely linked to specific emotions such as: **"worry"** which emphasizes worry and stress, **"thank you"** about gratitude and satisfaction, **"attack, war"** about conflict, frustration and anxiety, **"play, song"** which accentuates emotion over joy and relaxation.

Word cloud of employee's message

The word cloud displays the same findings on the frequency of words where we can make a first conclusion that allows us to say in this company, there would be a mix between work discussions, political or social topics and personal concerns.



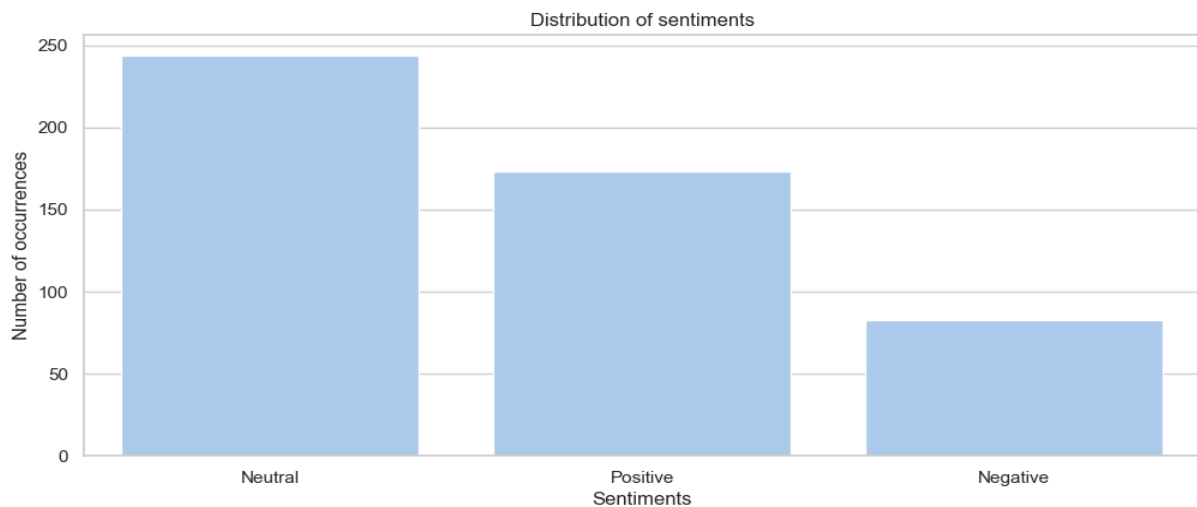
While our goal is to analyze the emotions of employees, we will first perform a more detailed sentiment analysis with the VADER Sentiment model from Python, followed by an analysis of the emotions from NRClex (joy, disgust, stress, etc.), in order to enrich this visualization.

NLP Sentiment/Emotions Analysis

In the context of understanding the reasons for employee resignation requests, sentiment and emotion analysis remains an excellent tool to better understand the opinions and feelings expressed in exchanges.

The VADER Sentiment model is a lexicon- and rule-based tool whose purpose is to analyze sentiment in texts while assigning scores to sentences in four categories, including:

- ✚ Positive: Indicates a positive tone
- ✚ Negative: Reflects a negative tone
- ✚ Neutral: Shows the absence of strong sentiment
- ✚ Compound: An overall score combining the previous three to give an overview



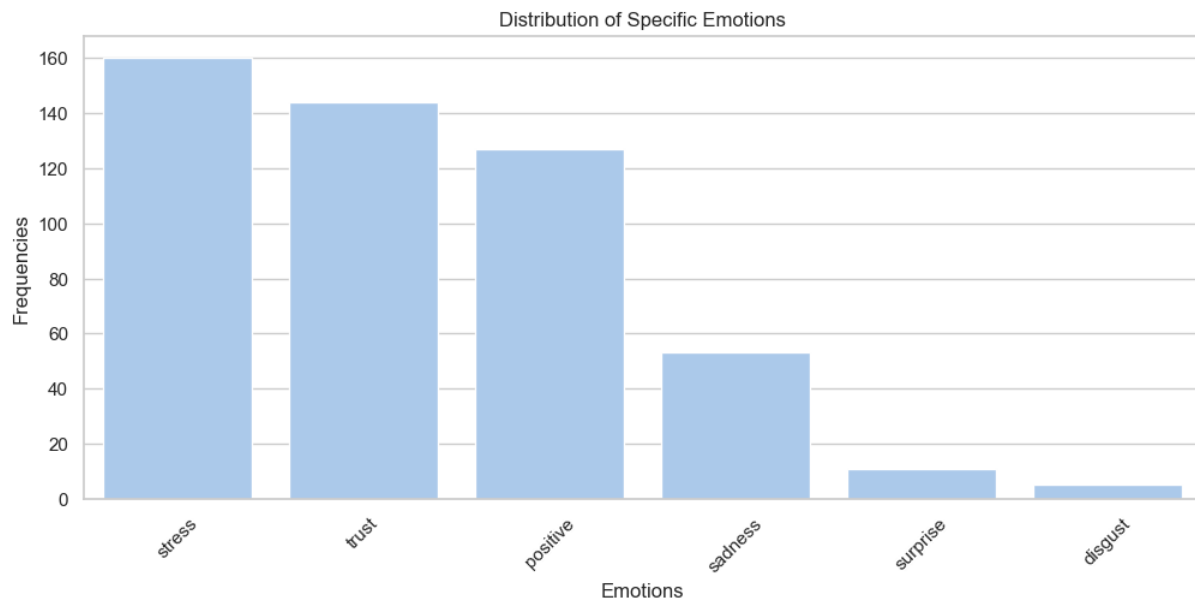
Textual data shows that many of the employees' messages are neutral (250 occurrences) and more precisely the messages are factual and without strong emotional charge. Although the neutrality of the messages remains important, it does not affect the analysis of sentiments, since employees also testify to their overall satisfaction (positive messages: 175 occurrences) and also a generally professional and moderate tone in the exchanges.

In addition, the sentiment analysis carried out with VADER Sentiment displays in addition to neutral and positive messages, messages classified as "Negative" with 90 occurrences, which allows us to note that employees share their complaints, stress and frustration or even specific concerns during their time with colleagues.

In the face of this analysis, it is good to know that overall the feelings of the employees seem positive, which includes saying that they feel partly good in the company because of the favorable environment. But, neutral remarks relate to the moments when they work on projects that their manager entrusts to them. In this work atmosphere, this does not prevent some employees from sharing their feelings, although many are positive, it does not erase the dark feelings of some employees that they do not hide. The question that arouses interest is: ***"Are the employees' concerns about the company itself or about their personal lives? Otherwise, how can we all resign at the same time when faced with such a result on our sentiment analysis? »***

To understand these questions, we will carry out an analysis of emotions in order to know specifically the emotions that employees share during their confession with colleagues. Do they share a sense of joy? Stress? Out of disgust? Or sadness?

In an effort to understand the queries after sentiment analysis, we'll use Python's NRClex to clear our doubts. Indeed, NRClex is a database that associates words with specific emotions while classifying emotions in a text according to categories such as: joy, sadness, anger, fear, surprise, to name a few. This natural language processing (NLP) model is ideal for our next study.



The bar graph shows the frequency of occurrences of different emotions such as stress, confidence, sadness, surprise and disgust. Each bar emphasizes a diverse emotion where the pitch of each bar corresponds to the frequency of that emotion.

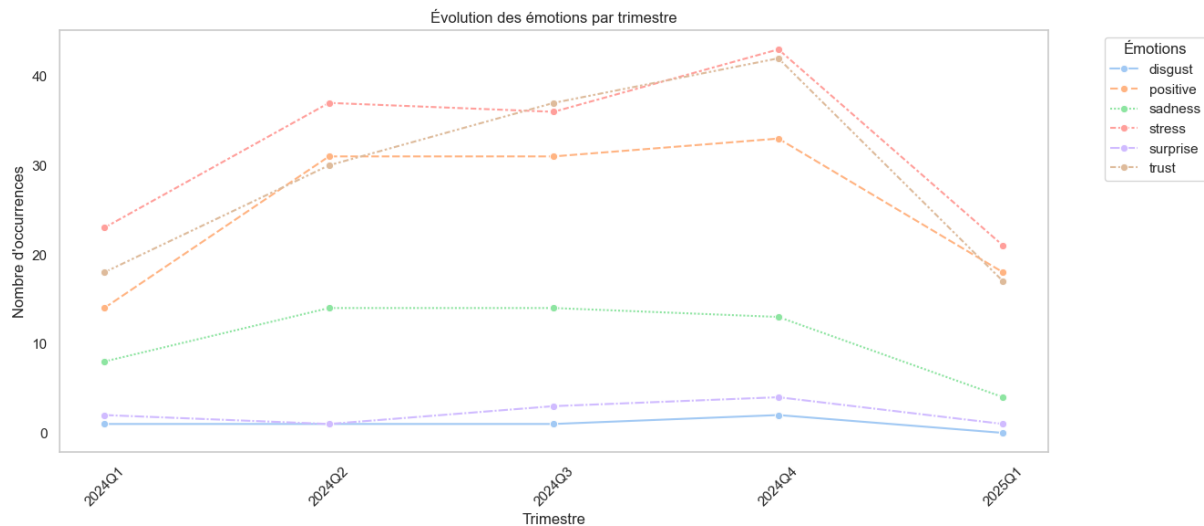
The findings of this analysis show that in this company, stress and trust are the most frequent emotions, which makes it possible to understand that colleagues are under extreme stress, but try to maintain their trust in the system and the people involved. Although on the one hand, this shows that the company does not lack missions, the company ignores the well-being of its employees. If employees continue to work with confidence, it is certainly because they are dependent on this system which does not give them satisfaction and joy. Certainly, this maintained trust of employees does not come from the encouragement of managers or the company, but from themselves. So, having found a way to free themselves from this system, they took advantage of the opportunity. But why are they motivated? The analysis of emotions shows a positivity of 125 occurrences. The extreme stress of the employees did not cause disgust or anger, but rather a positive emotion. This observation can lead us to draw the conclusion that employees have nevertheless kept positive and enriching experiences in the company.

Emotion analysis provides paradoxical results where the personal lives of employees interfere with the functioning of the company, which can probably be the cause of the collective resignation of employees. Indeed, the analysis observes a moderate-level emotion of sadness, well below the three dominant emotions. Immediately, surprise and disgust are rare emotions. This data allows us to understand that the sadness of employees manifests itself because they expect encouragement from the company. But the fact that the latter does not act according to their wishes, that emotions of disgust arise. If this disgust does not grow, the company must pay its employees well and respect everything that is said in the basic contract. Maybe employees call for encouragement like a mother congratulating her child?

In order to better understand the reasons for employee departure, an analysis of emotions over time will be very useful to understand when these various emotions begin to emerge within the company. Is this after a new reform? Or in a particular moment?

Changing emotions over time

The evolution of emotions will be done by quarter (from 2024Q1 to 2025Q1). The results of this analysis make it possible to understand in 2024Q4, positive and stressful emotions were particularly intense or striking. If emotions have reached their peak then, it suggests that this period is intense in the company where they are confronted with extremely urgent and particularly special missions, which require attention and meticulousness. But ***"how were employees able to keep their stress at the same level as their confidence during this intense period? Did the company offer a bonus at the end of this period? If so, what can justify the collective resignation of the latter? »***



In addition to this observation, we notice that throughout the year, sadness was always present. At first, a slight increase was noted, then remains relatively stable with a slight drop towards the end. Should I say that this drop in sadness was the moment when the employees had decided to resign collectively?

As the analysis of emotions initially showed, surprise and disgust remain at very low levels throughout the period with little significant variation. This result emphasizes that although these emotions are insignificant, they still arise. This is to say that the reasons for their appearance are not in vain. In 2025Q1, all emotions show a total decrease, exactly the moment when employees quit and I take over this mission.

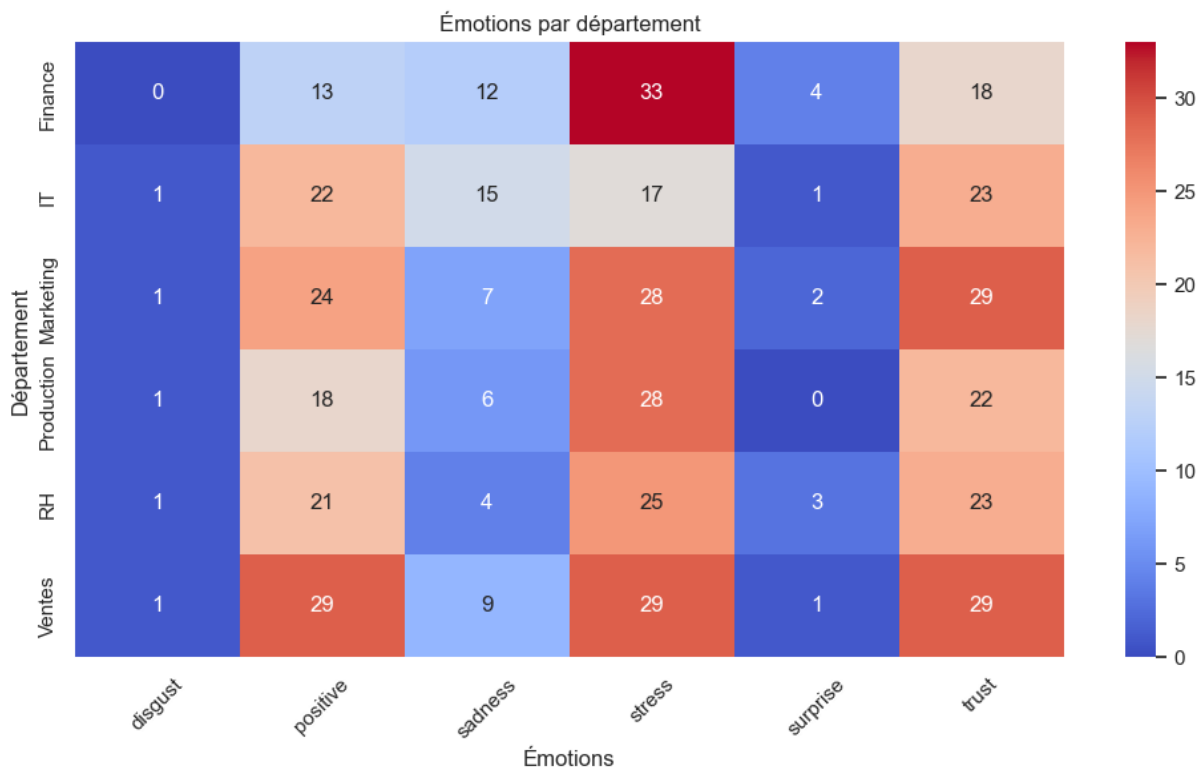
In view of this analysis, we can remember that the 2024Q4 period was a strong period for employees, although confidence was there, a hindsight made it possible to understand, after this period, employees find themselves in a period arising from various emotions such as sadness, surprise and disgust. ***A first conclusion allows us to understand that in itself, the company is not the reason for the resignation of the company, but a form of strike on their part to demand a raise, bonuses and incentives.***

Emotion analysis by department

So far, the company seems stable, but the resignation of employees raises a much more specific problem. An overview of emotions by department would help to better understand the reasons for this decision.

The chart suggests that stress is particularly intense in the **Finance department with a high score (33)**, while the **Sales department has high levels of confidence (29)**. On the other hand, emotions of sadness are more pronounced in the **marketing department of Production (24)**. Surprise and disgust are very rare with very low values.

After a moment of discussion with the Manager in the Finance department and the results of this analysis, the finance department is faced with a high level of stress due to the nature of the work, financial responsibilities or economic pressures.

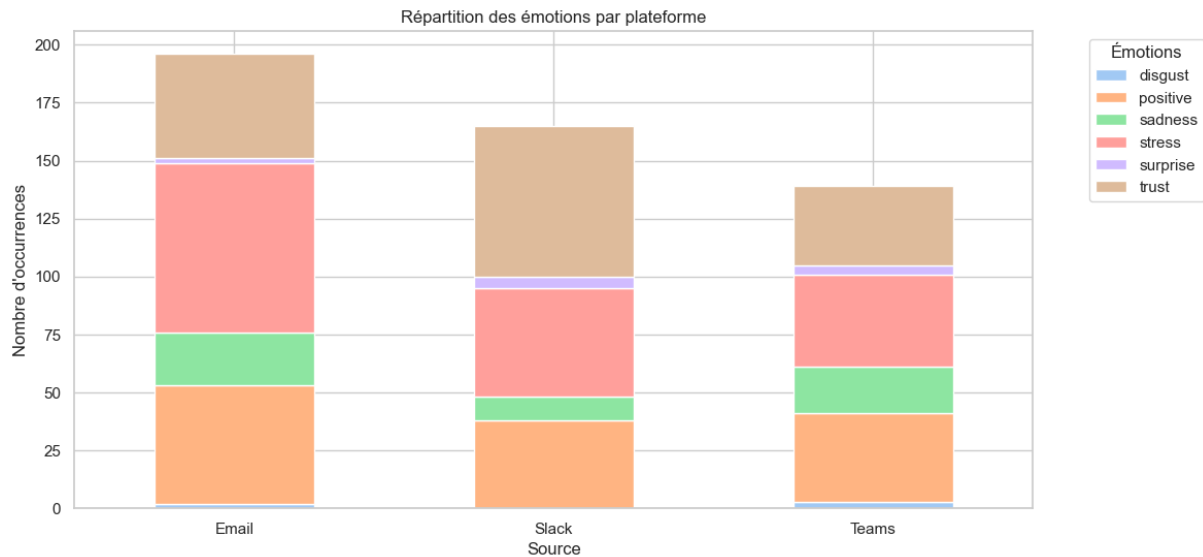


This business trust may be due to the competitive nature of the job, business successes, or team culture. The Production Marketing department sees itself in a production challenge, hence the question of emotions of sadness. Challenges particularly related to production, project management or collaboration. From this departmental analysis, it goes without saying that departments such as: Finance, Production Marketing, Sales are confronted with various because of their various objectives.

Distribution of emotions by platform

The **stacked bars** in the graph illustrate the distribution of emotions across different communication platforms. Each bar represents a specific platform, and the colored sections inside indicate the contribution of each emotion to the total occurrences. The total height of each bar corresponds to the overall volume of emotions detected on the respective platform.

The analysis reveals a **dominance of Email**, which shows the highest total number of occurrences of emotions. This suggests a more intensive use of this platform or more emotionally charged communication. In addition, the **emotional composition is relatively similar** between platforms, with a predominance of positive emotions, stress and confidence.



Stress **and** **trust** are strongly present on all platforms, but especially on Email. **Sadness** manifests itself at a moderate level, while **surprise and disgust** are rare, with very low occurrences.

These observations imply that **email plays a central role** in communication, probably because of its formal use, project management or exchanges with external clients. The strong presence **of stress and trust** reflects a demanding professional environment, but based on a certain reliability. Finally, the rarity of **surprise and disgust** may reflect a relatively stable and predictable work environment.

Overall interpretation

The results of this analysis led to an initial conclusion that emphasizes the extreme stress of employees, but which is immediately controlled? The 2024Q4 quarter proved to be emotionally intense due to the strong period of activity in the company. While stress was at its peak, it was obvious for the company to put in place stress management strategies, but no, it would have been necessary for the employees themselves to motivate themselves in order to get through this strong period. This quality shown by employees remains commendable and honourable because it shows that they could get through this

period more easily as long as they had hope or motivation (bonuses and recognition). Moreover, the analyses show that a fragile balance has been broken since beneath this trust and satisfaction, there was latent frustration. The company, although it was honoring its part of the contract signed at the beginning, it was no longer meeting the non-monetary expectations of employees such as encouragement, recognition, perhaps a better distribution of burdens. Thus, getting through the period of intense stress, the balance gave way and the collective resignation followed.

The conclusions of this analysis raise emotions that are both complex and paradoxical because it is not a simple story of discontent. Employees probably enjoyed the work experience, but it wasn't enough to retain them because the problem is deeper than just salary.

In summary, it should be noted that this is not a problem of unsustainable working conditions, but of a dynamic where the intrinsic motivation of employees has collapsed due to lack of recognition and support. The company lost talent not because of pressure, but because it was unable to recharge them emotionally after this difficult period.

Conclusion & Recommendations

The analysis of employees' emotions and feelings reveals a complex dynamic within the company. Although confidence and positive emotions are present, stress is a pervasive factor, especially in certain departments such as Finance. The company doesn't seem to be directly responsible for the wave of resignations, but it probably underestimated the impact of the emotional load on its employees.

So, to prevent future resignations and improve employee well-being, we recommend:

Implement proactive stress management

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- ✚ Implement strategies tailored to the most affected departments.
 - ✚ Offer support (coaching, rotation of loads, psychological support) to alleviate pressure during peaks of activity.

Valuing and recognising the work done

- ✚ Create a culture of positive feedback with regular encouragement.
- ✚ Implement recognition mechanisms (visibility of efforts, appropriate rewards).

Continuously analyze employee emotions

- ✚ Integrate monitoring tools to detect emotional trends upstream.
- ✚ React quickly to warning signs before an imbalance sets in.

Improving working conditions and motivation

- ✚ Adapt bonuses to periods of high load to value the effort made.
- ✚ Offer development prospects and support to maintain commitment.

Review communication and the psychological contract

- ✚ Assume and acknowledge past management mistakes with a sincere message.
- ✚ Review non-monetary commitments: recognition, growth, balance, professional/personal life.

Re-engage talent through a personalized approach

- ✚ Conduct one-on-one discussions to understand past frustrations.
- ✚ Propose solutions adapted to the expectations of each employee (flexibility, training, better working conditions).