

Erudit Report 02

'Workforce Affinity' Project to Replace Climate Surveys

25 October 2022

Overview

Employee surveys are one of the most common methods to measure an organization's climate and the employee's relationship with their job and the company. But digitization in recent years has dramatically increased the amount of communications data collected and stored by companies.

This report documents the development of a new solution that makes the most of an organization's organic, real-time data, instead of depending on surveys. In this report, one will find the following:

1. 10 key indicators or dimensions of culture, climate, and job satisfaction
2. Natural Language Inference (NLI) to automate the measurement of the key indicators
3. Evaluation of accuracy

The end result is a new feature in the Erudit platform, called 'Workforce Affinity', that produces the insights of an organizational climate report, but without conducting employee surveys.

Introduction

Currently, an employee survey is the main method to measure an organization's climate and the employee's relationship with their job and the company. While employee surveys have evolved through the years and digital technology has helped automate the process, making it more convenient for all stakeholders, there are still doubts about the reliability and validity of survey data.

There are many reasons why people might be less likely to reveal their true feelings about an issue: they may be worried that answers affect employment prospects; they may have a vested interest in the outcome; they may not understand the question properly; or they might simply not care to answer. This can make it very difficult to get an accurate picture of public opinion.

Still, employee surveys have been the only way HR and management can understand their staff better. So HR has been obliged to conduct time-consuming and labor-intensive surveys that require careful planning, execution, and analysis of the results. Not to mention the extra effort and skill to ensure that the survey process is handled in an unbiased manner.

Even with all the time, effort, and budget spent on surveys and on the feedback loop, a recent study revealed that 75% of decision-makers still think the feedback is not actionable

enough (Microsoft, 2022). It is also advisable to take all survey data with a grain of salt and look for multiple sources before making a decision based on survey data.

Could there be another way to extract sentiment and opinion that does not rely on survey data and could make the process easier and quicker for HR? With recent developments in artificial intelligence (AI) technology, particularly in the field of natural language processing (NLP), it is now possible.

Erudit has used this technology to anonymously analyze workforce metrics such as engagement levels, burnout risk, and turnover risk. The next phase of the solution is to explore applying AI technology to extract the measurement of each dimension or key indicator of traditional organizational climate reports. All metrics should be analyzed from organic, textual data, such as email and chat messages, with zero survey data.

This new feature is called Workforce Affinity and was developed by Erudit's Data Science and NLP Research Engineering Team to relieve HR professionals of the burden of employee surveys, while still adhering to the common framework. Without having to plan, design, and conduct employee surveys, HR can dedicate more time on analysis of people analytics, making it more actionable for managers, and, most importantly, improving the employee experience.

10 Key Indicators or Dimensions

The dimensions of an organizational climate survey are the variables that describe the environment in which the organization operates and employees work. The main goal of evaluating these dimensions is to understand the current state of the organization, based on the perspectives of employees. Different dimensions can be used to evaluate organizational culture, such as employee engagement, leadership, work-life balance, employee morale, and more. It can be used by managers to assess the level of employee morale, as well as by employees to gauge the level of happiness and satisfaction in their workplace.

Erudit's team of psychologists determined the top 10 dimensions to measure an organization's climate and culture, as outlined briefly below:

1. **Autonomy:** The level of control employees have over their own job and performance.
2. **Alignment:** How well do employees understand and adhere to the company's goals, values, and practices?
3. **Meaningful work:** The employee's perception that their work is significant and contributes to their personal and professional development.
4. **Organizational support:** The level of support employees perceive to have from management, colleagues, and the organization in general. Support can come in the form of resources, moral support, guidance, conditions, among others that contribute to their tasks and well-being.
5. **Peer relationships:** Whether formal and informal relationships in the workplace are good, collaborative and rewarding.

6. **Physical environment:** Is the environment, whether physical or virtual, conducive to work and getting tasks done? Does it improve productivity and motivation or induce stress and burnout?
7. **Professional growth:** The job and tasks contribute to their career development and learning and employees feel they can grow in the organization.
8. **Reward and recognition:** Reward refers to fair compensation for the job done and recognition goes beyond this, through acknowledgement and appreciation from the organization.
9. **Satisfaction:** Employees feel their needs are fulfilled and find pleasure in performing their job.
10. **Workload coping:** Employees feel ready, able, and supported enough to handle the workload assigned to them.

With the 10 dimensions established, the AI team can then proceed in developing AI technology to measure each dimension automatically from organic, textual data.

AI Technology to extract organic metrics

The Likert Scale

The AI measures each of the 10 dimensions from daily messages through a Likert scale¹ represented by a value between -100% and +100%. If a message is ranked at +100% for a dimension, it means that the message is in strong *agreement* with the dimension, and if the message is ranked at -100%, it means that the message is in strong *disagreement* with the dimension. If a message is ranked at 0%, it means that the message does not contribute clearly in either direction and is undecided.

For a department, team, or individual employee, the values of the messages under each are aggregated and averaged daily. *It is important to note that while the technology is capable of showing individual metrics, Erudit's company policy does not allow the platform to present individual metrics, only metrics of groups with a minimum of 5 members.*

Natural Language Inference (NLI) Model

To automate the measurement of each dimension from organic messages, the AI uses Natural Language Inference (NLI), a task under Natural Language Processing (NLP) that infers whether a given hypothesis is true, based on a given premise (cf Williams et al. 2018). In this case, a hypothesis and premise was designed specifically for each of the 10 dimensions.

Derived from BERT

The values mentioned in the previous section are obtained thanks to recent advances in natural language processing pretrained models, such as descendants of Bidirectional

¹ Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree

Encoder Representations from Transformers (BERT, Devlin et al. 2018), a Transformer architecture (Vaswani et al. 2017).

It frames the classification problem as a natural language entailment task such that the truth value of an hypothesis may be tested in a given context. The model aims at answering the question: *does the context entail, contradict or is unrelated to the hypothesis?*

We apply this idea in Workforce Affinity by considering each dimension as a separate hypothesis, for instance “*there is positive Satisfaction*”, and each message as a particular context. If the message entails the positive Satisfaction hypothesis (in other words *agrees* with the Satisfaction dimension), then the message receives a positive score. If the message contradicts the positive Satisfaction hypothesis (in other words *disagrees* with the Alignment dimension), then the message receives a negative score. The level of agreement is reflected in the score, the closer to 100%, the closer to a *strong* agreement, and vice versa for the disagreement and -100%. Each dimension is then evaluated separately to provide a differentiated rating.

Evaluation of Accuracy

To evaluate this approach, quantitative and qualitative analysis will be conducted regularly. The process involves a team of psychologists who rate a set of messages expressing agreement, disagreement, and neutrality with each of the 10 dimensions. This data is then compared with the results produced by the AI.

The results are promising. **We achieved 91% accuracy in differentiating between strong agreement and strong disagreement.** It is important to note that accuracy levels will still be improved over time.

References

[Devlin et al. 2018. BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding](#)

[Microsoft. 2022. Work Trend Index](#)

[Vaswani et al. 2017. Attention is All you Need](#)

[Williams et al. 2018. A Broad-Coverage Challenge Corpus for Sentence Understanding through Inference](#)