ABSTRACT:

In today’s competitive world companies are looking for candidates with strong communication skills and good social relations skills. Only candidates with these skills will be a strong team player. But for analyzing these skills companies are in lack of time and tool support is needed. In this project we design and implement a tool to analyze the employee job attitude using Facebook. For this we extract the Facebook feature. Analyze the employee attitude among co-workers and do the report. Once score is received from the attitude analysis module it will give the total ranked score using Pearson correlation to rank the candidates. Also it organizes the scores neatly in a report, so that HR can analyze it easily. In this project we are using Hadoop map reduce concept to process large set of profiles in parallel. Also, neural network classifier is trained to classify messages as good or bad. NPL library to find the proficiency of messages, this library is built in with Naïve Bayes’ classifier. Finally, we are ranking the user for his/her proficiency and social relation skills which are very important asset for any organization along with strong technical skills.

Keywords: Social Network, Facebook Analysis, Neural Classifier, Attitude Analysis

[1] INTRODUCTION

Recruitment for any job openings is a very challenging task for HR Professionals. When an organization looks for a particular individual for any job looks for strong technical skills and soft skills. Soft skills is the word always associated with person’s “Emotional Intelligent Quotient” (EQ). Soft skills are like person’s communication, language, interpersonal skills, personal habits, leadership, and managing people that shows the relationship of a person with other people. Though the person possess very strong technical skills if he/she is not a good team player or not sharing their knowledge with fellow team members it is of not much use to an organization. So, person’s interpersonal skills are very important along with technical skills. Social networks like LinkedIn and many job portals are good enough to maintain analyze the technical skills of a person. It is easy to analyze person’s soft skills with Facebook as it is a
platform that most of the people use to link with their friends, colleagues, relations and sometime mutual friends and unknown people also. Facebook is platform where individual now a days use it to help each other. People share for medical help, missing information and so on. So, it is easy to analyze person’s attitude towards social activities and what he/she is involved in their day to day activities with Facebook.

Each organization’s requirement for a candidate may vary based on the platform or the domain they are working. For example Sales and Marketing job needs people with strong communication skills and people who are very social. Advertisement and media job may demand for people who are creative. Games developing companies demand for candidate who are interested in playing games and creative. Some companies may look for people who are positive and of can do attitude mainly start-up companies. Few companies may look for candidate who is flexible and ready to work on different technology or methodology and ready to put extra effort like working extra hours. It is easy to analyze person’s interest as well with his/her posts from Facebook profile.

Why Facebook? Facebook is the top most used social network, second twitter and then LinkedIn is in third place. Facebook has around 1.59 billion monthly active users. Facebook has become daily routine of most of the people. And most of the people on Facebook are very active and update about their life status, share the posts, play games, join interested groups. Companies share advertisements as well. In our paper as in [Figure-1], we are extracting user personal details, posts, messages, groups registered for, games played and so on. Then we classify messages based on neural classifier to find out number of positive and negative messages. Also, we use OpenNLP library to find the message proficiency of the user. Finally, we generate a report which ranks the user on proficiency level, social score, and activity score. This report will be given to HR for analysis.

![Figure: 1 Social Network, Person attitude can be positive, neutral or negative](image)

[2] RELATED WORK

In [1] integrates and expands two models of organizational support perceptions, job attitudes, effort, and employee behavior (i.e., Brown & Leigh, 1996; Netemeyer, Boles, McKee, & McMurrian, 1997). The purpose of [2] study was to provide insight on attitudes towards Facebook advertising. The article [3] identifies three major gaps between HR practice and the scientific research in the area of employee attitudes in general and the most focal employee attitude in particular—job satisfaction: the causes of employee attitudes, the results of positive or negative job satisfaction, and how to measure and influence employee attitudes. The article [4] investigates Facebook users’ awareness of privacy issues and perceived benefits and risks of
utilizing Facebook. Real-world applications [5] demand effective methods to estimate the class distribution of a sample. At a first glance, the straightforward conclusion could be that this task, recently identified as quantification, is as simple as counting the predictions of a classifier. Forman [6] was the first in identifying and naming the quantification problem. A (novel) machine learning task which deals with correctly estimating the number of elements of one class in a set of examples. In [7] addressed is the problem of quantification, a supervised learning task whose goal is, given a class, to estimate the relative frequency (or prevalence) of the class in a dataset of unlabeled items. In [8] Class distribution estimation (quantification) plays an important role in many practical classification problems. In [9] the increasing availability of digitized text presents enormous opportunities for social scientists. Although computer scientists have methods for automated content analysis, most are optimized to classify individual documents, whereas social scientists instead want generalizations about the population of documents, such as the proportion in a given category.

[3] ARCHITECTURE

Architecture in [Figure-2] basically has three modules one for Facebook profile extraction, second for classification and evaluation and final one for reporting the score.
[4] EVALUATION

[4.1] MESSAGE IS NORMAL OR ABNORMAL

We are using Neural Classifier to find message is normal or not. This involves two steps:

Input Layer  Output Layer  Hidden Layer

In this section we train neural network classifier for pattern of good and bad message category. Each input sentence is converted to Vector Space Notation (VSN). The VSN will extract correct words, bad words, Capital words, punctuation characters, Question marks.
In [Figure-3] the leftmost layers are called input layers, middle layers are called hidden layers and the right most layer is called output layer. The input layer consists of set of neurons \( \{x_1, x_2, x_3, x_4, x_5, x_n\} \). Each neuron in the hidden layer transforms the values from previous layer in the form \( w_1x_2+w_2x_2+w_3x_3+\ldots+wnx_n \) which is a linear summation.

Multi-layer perceptron is a learning algorithm that that learns a function \( f: \mathbb{R}^m \rightarrow \mathbb{R}^o \) by training on a dataset, where \( m \) is the number of dimensions for input and \( o \) is the number of dimension for output. Final output can be written as \( output = \sum WiXi + b \) where \( i \) value ranges from 1 to \( n \). Based on the neural network firing 0 or 1, the input sentence is classified as abnormal or normal.

### [4.2] MESSAGE PROFICIENCY LEVEL

To find the proficiency level of input message OpenNLP library. The OpenNLP tool will break the sentence into grammar like nouns, verbs etc. and then order the nouns, adjectives based on their complexity level, from high vocabulary to low vocabulary. We take only the high vocabulary and see what the percentage of it is in total sentence. The message proficiency is calculated as: \( Proficiency = \frac{\text{No of good vocabulary}}{\text{Total words in sentence}} \)

### [4.3] SCORE CALCULATION AND REPORTING

Profiles extracted from the Facebook will be calculated as:

- **Message normality score:** Message normality score is calculated as \( \frac{\text{No of good message}}{\text{Total Message sent}} \)
- **Message proficiency score:** Message prof score is \( 5 \times \text{Count of Level 0 message} + 4 \times \text{Count of Level 1 message} + 3 \times \text{Count of Level 2 message} + 2 \times \text{Count of Level 3 message} + 1 \times \text{Count of Level 4} \)
- **Social Score:** Social Score is calculated as \( \frac{\text{total friended}}{\text{(friended + defriend)}} \)
- **Activity Score:** Activity Score is calculated as \( \frac{\text{(No of comments + forwards)}}{\text{total posts}} \)

The HR Admin can view the scores of candidate and also collect top K records according to different scores.

### [4.4] PARALLELISM WITH MAP-REDUCE

When company is doing bulk recruitment and there are thousands of profile, then it is difficult to process records sequentially. Say each record process 1 sec and there are 1 lakh records, then it will take around 1 lakh seconds. To reduce this process time, we implement to Map-reduce with Hadoop Big data.
To access Facebook features user has to give permissions which he/she wants to share. [Figure-4] show the screen to select permissions.

Facebook API allows to extract the features like personal details of a user, posts, messages, social groups joined, games played, number friends, number of defriends, events, websites and many more as shown in [Figure-5].

Finally the soft skill report of user is generated as shown in [Figure-6], which shows message fairness, proficiency level, social activity score.
CONCLUSION

Social Network Analysis like Facebook helps any organization to understand candidates’ soft skills like communication, attitude, and social activities. For any organization candidates’ soft skills are equally important as technical skills. Big data analytics plays a major role in analyzing social network data.

REFERENCES

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