STRESS DETECTION IN IT PROFESSIONAL BY MACHINE LEARNING

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Abstract:-

Stress levels amongst the Indian employees have increased due to a variety of factors and are a matter of great concern for the organizations. This study is based on Indian working professionals and real data has been collected by using non-probability convenience sampling. A questionnaire was drafted based on eighteen factors affecting the mental health of professionals. This study addresses two dimensions, first is to identify the important influential features that trigger stress in the lives of working professionals, and the second is to predict the stress levels. Various supervised machine learning algorithms have been experimented with and of all these algorithms, the Support Vector Machine Regressed model showed the best performance. The main contribution of the paper lies in the identification and ranking of ten important stress triggering features that can guide organizations to develop policies to take care of their employees. The other deliverable is the development of a GUI-based stress prediction software based on Machine learning techniques. As the globalization, is expanding individuals twist towards the cutting-edge life Stress issue turns into a significant issue among in experts and understudies life. The term pressure is causing different mental issue face to face. Understudies of various courses and distinctive expert college are expanding ambushed with this pressure. The points of this examination are to research natural, social, mental and scholarly postgraduate and doctoral understudies. The quantities of tests of this investigation are 220 undergrad and postgraduate understudies. The information of my examination was gathered independent from anyone else – planned poll and by PSS Scale and the overview has organized inquiries which were gathered through google dox. There are many pressure expectation calculations has been proposed like SVM, KNN, RANDOM FOREST, NAVIE BAYES, LOGISTIC REGRESSION, DECISION TREE. Different machine learning methods are utilized that related in this field. Too, it talks about the application territories and difficulties for stress forecast with knowledge into the past research work.

Keywords: Stress, Prediction, classification, Machine learning, Questionnaires survey, weka tool.
DOI Number:10.14704/nq.2022.20.8.NQ44559 **NeuroQuantology 2022; 20(8): 5268-5282**

I. INTRODUCTION

Modern society is witnessing a continuous deterioration in the occupational health of working professionals in India. According to the latest reports for the year 2020, by ADP Research Institute, 70 percent of the Indian workforce is suffering from stress at their workplace which is a matter of grave concern. Survey reports by 1to1help, an Employee Assistance Program provider in India have found that there has been a large increase in the number of employees who are highly depressed or are vulnerable to suicides due to an increase in stress in their lives. Another surveyor, Optum affiliated with Nasscom, observed that almost half of the Indian

employees suffered from some type of stress or mental health issue. They surveyed eight lacs employees in seventy major organizations, each with a minimum staff of four thousand and five hundred. The results were alarming and stated that the ratio of employees at high risk of taking their lives due to stress had increased from 4% to 8% in two years. They also found that family, money, and job were the most common stressors amongst the employees.

Parenting, pregnancy, change, care giving, and social isolation were some more factors that led to stress. Some employees also fear for their job security in the restructuring of the organization even though they are better paid. It is specifically true for managers who are in a middle-level position and have the responsibility of kids as well as loans. Employees are also found to be struggling with stress in their personal lives due to broken relationships or marriages. Newer factors like social media also contribute to the intense peer pressure that expects people to have a certain lifestyle or be a certain image to qualify as successful. This undue and unmanaged stress leads to mental health issues *viz.* anxiety and depression, and damage to physical health by causing frequent headaches, elevated blood pressure, chest pain, upset stomach, and problems sleeping.

Stress is an issue which is expanding step by step which additionally influences the individual physical and mental wellbeing. [1] As the individual are moving toward the path for accomplishing development in their own and calling which is the significant reason for worry in the present life. Nowadays as the challenge is expanding in each field, the anxieties become the serious issue which influences the person's wellbeing which additionally causes genuine medical problems [2]. The expression "Stress" signifies when there is an issue which cause inconvenience to the individual and give them any sort of mental issue. On the off chance that the pressure is antagonistic and influences the individual wellbeing is called misery and this additionally lead to the different mental issue or confusion. It sways on our body opposition which may cause may difficult issues which we are uninformed of and these sort of issue prompts serve physical medical problems like, coronary failure, mind related issue, rest issue [3]. Stress is basic in our day by day schedule life, which is pressure yet the vast majority of the pressure is trouble. Stress come when humans fail to wellbeing himself in the environment with high challenge. Mostly stress occurs when people tried to act against their emotion or mental condition [4].

Human body controls its inside condition by different physiological procedures, and keeps up at a specific condition of balance called as homeostasis. "Hans Selye was the dad of stress specialists and have given numerous speculations on worry in look into. His view in 1956 was the "Stress is an inclination of enthusiastic or physical pressure." Selye accepted that the biochemical impacts of pressure would be experienced independent of whether the circumstance was certain or negative. In 2010, Hornby is characterized worry as "weight or stress achieved by issues for an amazing duration. As per lazarus and Folkman in 1894, Stress emerges when an individual neglect to adapt to the extrenal condition or encompassing because of unexpected situation of exceptional requests on him/her. It rises when an individual has selected prerequisite (Fairbrother and caution, 2013) which consistently doesn't organize with his capacity. In this time, understudies square measure casualties of economic process and its difficulties., family troubles, love disappointments (Blain and McArthur, 1961), negative economic, everyday problems (Carr and Umberson, 2013), and scholastic weight on the understudies square measure purpose of pressure currently a days in light-weight of the burden. apart from this displaying style, approach of mastering and affiliation among understudies and professional person within the study passageway square measure a component of distinct factors that deliver regarding strain, throughout tests, When

understudies neglects to urge nice stamps in assessment, they get American state persuaded that builds the suicidal inclination among them. consistent with United Nations agency reports in 2014, suicide worth is high amongst understudies because of the very fact of studious weight. In India ,857 understudies students complete it all because of the scholastic check pressure or weight, (Desai, 2006). The National Crime Records Bureau a pair of,471 understudies have distributed suicide(2013) because of the very fact of assessment disappointment in India. to boot the days of India's Survey (September ten, 2014) has expressed that Martinmas of the understudies and seven.8 % school understudies have endeavored suicide and out of every 3 suicide, there's one early life United Nations agency incorporates a location with the age gathering of 14–28 years. All things considered, "the subject of stress is bewildered and complex [13]. Stress can be defined by different aspects known as stressors including, social stress, environment, physiological, thoughts, emotional, anxiety.

II. SOURCES OF STRESS

We can experience stress from four basic sources:

A. The Environment

The external source of stress can occur by the environment in which the individual is unable to adjust with the external or internal stimulus which results in the cause of stress. Examples of environmental or external stressors include weather - cold or hot, disturbance, crowding, pollution, traffic, unsafe environment and increase level of crime.

B. Social Stress

The outside wellspring of stress can happen by the earth wherein the individual can't modify with the outer or inward improvement which bring about the reason for pressure. Instances of natural or outside stressors incorporate climate – cold or hot, unsettling influence, swarming, contamination, traffic, hazardous condition and increment level of wrongdoing.

C. Physiological

Everybody can encounter various Stressors throughout their life, on account of the distinctive social job we play in our public activity. Each individual assumes an alternate social job in their everyday life so as to live in a general public, for example, parent, life partner, guardian and representative. A few instances of social stressors incorporate cut-off times, money related issues, work uncertainty, introduction, contradictions, interest for your time and consideration, loss of cherished one, separate, coworking. This pressure happens when an individual can't assume a social job and not ready to rival the various individuals from the general public.

D. Thoughts

Each individual is unique and each individual see a similar circumstance in an alternate sense or way. Some individual translates and sees circumstance as upsetting, troublesome, and agonizing and some individual see the conditions as a lovely and attempt to unravel that circumstance smoothly and quietly. Some circumstance in life is pressure inciting, however it is our considerations that decide if they are issue for us and open door for us.

III. MACHINE LEARNINGTECHNIQUES

Machine learning has huge application in every area and it is growing rapidly because of its effective [4] approaches in prediction and classification. The dataset used in this approach. Basically, machine learning are two types supervised and Unsupervised.[1] Now we are discussing some techniques of machine learning are -:

A. Naïve Baye's

Naive Baye's classifier belongs to the formula of probabilistic classifier [1]. It is based on the Baye's Theorem. Despite its naive design and simplicity i.e. t can be applied to very complex problems. This classifier is based on the assumption that feature is independent of any other feature. Naive Baye's classifier uses maximum label time.

B. Logistic Regression

Logistic Regression is a type of technique used in machine learning. Logistic regression is widely used for the statistical model. Logistical regression is also known as statistical learning technique in supervised machine learning method dedicated to 'classification' task.

C. Multilayer Perceptron

Multilayer perceptron (MLP) is a class of feed forward neural system. It comprise of three layers. They are related with different loads. The Input layer ,Hidden Layer and the Output Layer [4].

D. Baye's Net Baye's

Net utilizes the strategy that can actuate a Bayesian system B, that encodes a circulation PB(A1,...,An, C), from a given preparing set. We would then be able to utilize the subsequent display so given a lot of characteristics a1,...,an, the classifier dependent on B restores the name c that boosts the back likelihood PB(c|a1,...,an).

IV. LITERATURE REVIEW

In past, many descriptive and inferential approaches have been applied by researchers all over the world to understand the stress-causing factors from various dimensions. These factors *viz.* workplace environment, workload, job security, relationship with family members, have been studied by researchers with a statistical approach or data mining approach. Many such papers have been critically studied and analyzed to derive a systematic methodology for the prediction of stress based on minimum features. These papers are based on data of employees of different organizations like sugar mills, agricultural institutes, banks, and educational institutes, all sectors being from various countries like India, Malaysia, Vietnam, and China. Most of the authors have applied a statistical approach in their studies for finding a correlation between various stress-causing factors and regression analysis for understanding cause-effect relationships. Many of them have checked the reliability of their questionnaire by using Cranach's alpha coefficient for each stress-causing factor. A summary of different papers has been presented that built the basis of selection of influential factors and finally minimizing the set of features so that a machine learning algorithm can make a prediction even before the actual serious impact of stress creeps in.

Prasad et al. (2015) have tried to find out the causes of stress in the employees of the International Agricultural Research Institute, Hyderabad, and its effects on their performances. They also wanted to find out the proficiency of the management techniques used at the workplace to reduce stress and evaluate how workplace stress affects them physiologically. The authors collected the information of 200 employees via a structured questionnaire and checked its authenticity with the help of Cronbach's alpha coefficient for each variable. In this paper, the performances of the employees were checked based on absenteeism, poor work relations, reduced productivity, low self-esteem, and feeling of boredom at the place of work. They found that stress existed on a medium level amongst the employees and it negatively affected their performance. The authors used Regression analysis to find the cause-and-effect relationship between the factors and the performances of the employees. Karl Pearson's correlation coefficient was also calculated to find the relation between the various stress-causing factors and the performance.

With a focus on stress-causing factors that fall under just one category, Pattnaik and Mishra(2016) looked into organizational factors as a reason for bringing in stress. They tried to find out people's thoughts towards the relation between stress and competition in the workplace. The data of 72 employees were collected via a structured questionnaire, and telephonic, personal, and online interviews. The data were interpreted with the help of categorizing of data, tables, and pie charts and it was found that the employees do experience stress which has both negative and, in some cases, even positive effects. The two prime factors were excessive workload and

organizational conflicts. The men felt frustrated and also felt a lack of concentration when stressed whereas the women felt frustrated and exhausted when stressed and both experienced lifestyle imbalance. Both female and male employees also faced physiological effects. The employees believed that stress is more in a highly paid job and they also felt that the facilities to manage stress at the workplace is not enough. It was observed that the female employees were more vocal in comparison to men in terms of sharing the problems related to stress.

A similar study has been conducted by Saravanan and Muthu Lakshmi (2019) to calculate the stress level of the employees of a Nationalized Bank in Trichy city. The sample size of the employees was 100 and a structured questionnaire was utilized to collect the data. The questionnaire was built with the help of a statistical package of Social Sciences. The answers of the questionnaire lay on a Likert scale of 1 (Strongly disagree) to 5 (Strongly disagree) for stress management. The data was then studied with the help of graphs and statistics and it was found that major stressors were interpersonal conflict and work pressure. They also concluded that more than fifty percent of employees can manage stress. They recommended that stress can be managed by meditation, yoga, exercise, different types of therapy, networking, and hobbies. Next, the teaching staff of an educational institute was studied by Rawal & Mhatre, 2018, to identify the factors that cause stress. The authors investigated the impact of stress on their productivity and performance and suggested recommendations to tackle stress. They conducted their study with the help of a questionnaire formed with help of primary and secondary data. It was found that the professors faced work-related stress along with family-related stress. They often had an overload of work and would neglect their homes to meet deadlines at the organization. But they feel that the measures taken by the organization to help manage stress do work well and they can comfortably manage a social life. This study too focussed on a general approach towards reducing stress.

Another study was done on a sample size of 100 participants that focussed on three major features *viz.* workload, job security, and shift duty concerning the performance of the employees (Vijayan, 2017). The authors studied the relation of the stressors and their impact on performance at the place of work by applying different statistical methods *viz.* T-test, Chi-square, correlation, and regression. It was found that the mentioned three features are positively correlated and have a huge impact on employees' performance. Of these features, the workload was found to be impacting the most on the performance of the employees.

Kuong and Yen (2016) conducted a study in Vietnam by collecting data from a sample size of 378 employees, using a structured questionnaire with a Likert scale of 1 to 5. They utilized SPSS software for exploratory factor analysis to enhance the dependability and authenticity of the measured variables and to find the relation between them. It was done with the help of Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity. They also made use of Varimax Rotation for independent and dependent variables. Path analysis and multiple regression were used to find the relation between the dependent and independent variables. The study was mainly done on five major features *viz.* work overload, role ambiguity and role conflict, working relationship, career development, working environment, and their effect on the job stress and job performance was analyzed. They found that these factors affect job performance through job stress directly and indirectly. They concluded that the working environment was the major factor that affected job stress, followed by working relationships and career development whereas working relationships came out to be the major factor that affected job performance followed by working environment, job stress, and career development. These three features were

related to job stress positively. They also found that work satisfaction played a big role in stress levels and performance. The authors were able to rank the stressors but could not do any prediction of stress levels.

In yet another work, the authors (Murali et al., 2017) aimed to find the effects of mainly four factors viz. workload, the pressure of time, lack of motivation, and role ambiguity on the performance of employees. The study was done on employees of a Malaysian organization and the sample size used was 136 respondents who were between the age of 20 to 60years and had 30years of experience in the field. Data was collected through questionnaires with a Likert scale of 1-5 whose normality was checked with the help of Kurtosis and Skewness and reliability was checked with the help of Cronbach Alpha. Descriptive analysis, correlation analysis, and regression analysis were applied to interpret the data. They found that the major factors that affected the performance of the employees were time pressure and role ambiguity. They also found that less support from the organization adds to the job stress and job dissatisfaction. There are little different findings by Sahoo, 2016 based on Health and safety executive model, and the main contributors for stress have been identified as job content, workload, and workplace, working hours, participation at the place of work, authority, career development, pay and position in the organization, interpersonal relationships, organizational culture, work-home interface. The effect of stress has been analyzed from two dimensions *viz*. on individuals and organizations. The effects of work stress on individuals were physical, emotional, intellectual, behavioral. Effects on the organization came out to be high staff turnover and recruitment costs, high absenteeism and presenteeism levels, reduced productivity levels, increased health and safety issues, litigation, reputational damage, increased training costs. The author has also listed the resources that could help manage, reduce and prevent stress to help the employees.

An interesting and unique study has been performed by Lawanont and Inoue (2018) that made use of multiple sensors, Raspberry Pi, and Arduino to collect data. Three force sensors were used to study the working behavior, the first sensor in the cushion of the seat, the second in the table mat, the third in the mouse pad. The amount of pressure applied can be related to the stress levels of a person. Temperature and humidity sensors, ambient light sensors, etc were used to collect data about the working environment. The Arduino board was connected to all sensors and the pre-processing of the data was done via the Raspberry pi. A 10-question survey known as PSS (perceived stress scale) was used to calculate the stress levels of a person for a month. This study was performed on 7 participants. Unsupervised learning was utilized on the data frame to form clusters to find the relation between the level of stress and the working behavior of each feature. They made use of k-means clustering and hierarchical algorithm for the clustering of data. These clusters were then used to analyze and interpret the data. In both the algorithms, the environmental features were alike between the two clusters. The characteristics of the clusters also indicated information about working behavior that was related to PSS score such as, where working behaviors in cluster A (higher stress) were probable to have fewer changes in active working whereas cluster B represents more active working. Most of the cluster's members showed that it was also related to the lower PSS score. Results showed cluster B consisted of the working behavior that led to the lower stress level. With this approach too, the prediction model could not be developed.

A study by Reddy et al. (2018), is based on the survey conducted by OSMI (Open Sourcing Mental Illness) during the year 2017. It consisted of 750 responses from the employees. The dataset at first contained 68 features from both personal and work life. The

authors used many machine learning techniques like Logistic Regression, KNN Classifier, Decision Trees, Random Forest Classifier, Boosting, and Bagging. To evaluate the models, they used Classification Accuracy, False Positive Rate, Precision, AUC (Area under Curve) Score, Cross-validation AUC. They found that boosting achieved the highest accuracy of 75.13, thus performing better than other models when accuracy, false-positive rate, and precision are taken into account. Whereas with cross-validation AUC, Random forest classifier achieved the higher score. They also found that women were more mentally stressed than men and the employees at a tech organization had a higher risk of developing stress and mental illness. To achieve a better performance response, an ensemble of the basic machine learning algorithms has been experimented with by Odusami et al. (2021). The authors developed a hybrid machine learning model, K_LoRD, that is based on four different algorithms *viz*. K Nearest Neighbor, Logistic Regression, Random Forest and Decision Tree. This hybrid model outperformed the ordinary individual models in terms of Accuracy and Receiver Operating Curve for the prediction of customer churn in the Telecommunication industry.

Fei and Bing (2012) performed an interesting study that applied exploratory factor analysis and further authenticated the results by performing confirmatory factor analysis. The findings relate the dynamic development of the working state of the workers with their psychological contract content with the organization. The authors analyzed two groups of participants where the first group had 169 participants from Beijing, Tianjin, and Langfang, and the second group had 219 participants from Beijing, Tianjin, Qingdao, and Shanghai. They conducted this study based on their background, work stress calculations consisting of eight features, and psychological contract calculations which comprises of nineteen features. To analyze the data, the authors made use of regression analysis and found that at various levels of educational background there are various and diverse effects of transactional contracts for workers on work stress. Like for example, people tend to go for rewards equivalent to how much effort their job expects from them. In the model of this study, three angles of the scalene triangle are the dimensions of psychological contract notable by the worker. A point inside the scalene triangle is the work stress that is in line with the policies to manage the psychological contract, which forms the best balance of work stress fitting in with the psychological contract structure. In particular, as the dynamic development of the working state of the workers, their psychological contract content also changes, which in turn affects their perception of investment symbols given by the organization.

Burman and Goswami (2018) have reviewed the work of various authors that focussed on stress at the workplace and categorized them based on certain factors. The authors divided all sources and literature into four categories as journals, author profile, research methodology, and type of industries/research. They discovered that after reviewing the conceptual and descriptive research material on work stress, they could draw the basics and understanding of it. The study also found that there were a greater number of empirical studies than exploratory and longitudinal studies and that the bulk of the articles were not by professionals but rather by academicians. The top three contributors to these research papers and materials were from the US, UK, and India in that order. They also discovered that even though India has contributed to this research, based on both practical and conceptual knowledge related to stress, and its effects but the scientific findings have not been put to much use to deal with the actual problem. Adequate management techniques and tools are not being used to reduce stress levels; they are still only on paper. The research material also shows that stress from a workplace affects their performance and productivity at the organization as well as their

physical and psychological well-being. Work stress can also lead to various diseases like coronary heart disease, blood pressure, depression, anxiety, nervousness, etc.

A study chose a sample size of 130 participants from various private institutes in Hyderabad, India by Stratified Random Sampling (Rahoo et al., 2017). The objective of the study was to find out the causes of work stress amongst the faculty members and how satisfied the members were in a private institute. They discovered that several stressors were disturbing the teachers. Demands at work, work relationships, role, position, pace and intensity of change in the workplace, and lack of support were found to be a major stressors. It was found that Age, Gender, and Marital status directly affect stress due to major differences found in the analysis of each factor and its relationship with stress. After combining the results of analyzing all the factors including the main cause of tension between the participants, poor peer relations, lack of rest, long working hours, harassment by the staff, lack of communication, lack of wage employment, and limited training, were major stressors and it was also witnessed that workplace stress plays a major role in the stress in an individual's lives. Stress and job burnout outgrow when there is role erosion, role overload, resource inadequacy, role isolation, and role ambiguity at the workplace. Here the focus was related to roles played by employees in various spheres of their jobs.

A case study in China had a sample size of 240 respondents, their data was collected via a questionnaire consisting of twenty-four questions (Meng & Wang, 2018). The prime statistical methods ANOVA and multifactor line regression were used for the analysis of the work stress of the university faculty. It was observed that the levels of stress of university faculty are significantly affected by professional status, age, and period of teaching. Along with them, administrative affairs, structural constraints, and personal characteristics play a major role in the work stress of the faculty members. This empirical study discovered that the mechanism used for evaluation which is based on quantitative performance indicators has significantly increased the occupation-related stress on the teachers.

Another research by Bhui, et al. (2016), aimed to recognize the stressors at the workplace and also the personal, individual, and organizational management programs or techniques that employees use to reduce their stress in public organizations, private organizations, and NGOs. Their sample size was 51 participants from various organizations. Qualitative interviews were conducted to collect the data from the participants. Results showed that unfavorable working environments and management practices were major and common stressors in the workplace. Along with those factors, unrealistic requests of work, lack of support, bad or unfair treatment, low decision-making freedom, lack of appreciation, effort–recognition imbalance, conflicting roles, lack of transparency, and poor communication within the organization were some more factors that led to increase in the stress levels of the employees. They found that organizational programs were found to be very helpful in reducing stress levels if there was an improvement in the management styles, which included physical exercise, breaks in between, and making sure that there is enough time for planning work tasks. Also, to prevent and reduce stress, personal interventions were very significant.

Shapiro et al. (2005) have gone a step ahead by suggesting a stress management program, for health care professionals that would decrease the level of stress and improve their quality of life. Frank et al. (2015) also studied the effectiveness of a similar type of mindfulness-based stress reduction (MBSR) program on educators. They observed the improvement in the quality of sleep of the respondents. These authors also could not provide any insight into understanding and predicting stress in advance.

One similar study by Rawat and Sultana (2021) demonstrates the application of Machine Learning algorithms for advanced resource planning in Hospital Emergency Departments. The authors have developed their model called light gradient boosted machines (LGBM) and found that its accuracy and time taken for prediction is better than other ordinary ML models like decision tree and GBM.

After reviewing all these research work by various authors globally, it was observed that none of the studies was offering a complete solution from the identification of stress-causing factors to the selection of a minimal subset of important stressors to the prediction of stress. Hence, the following three research gaps were observed:

1. It was found that none of the studies is based on all factors that surround the lives of working professional's *viz*. Organization Specific, Personal Factors, Work Environment Specific and Job Profile Specific

2. It was also observed that none of the studies focuses on the identification of the most influential stress-causing factors in a ranked manner.

3. Also, none of the studies is able to predict the stress level of the respondent.

This paper fills these gaps with the help of machine learning algorithms for ranking stress-causing factors and comparing and then applying the most accurate algorithm for the prediction of stress. Machine learning algorithms can provide a reasonably good accuracy of prediction with the number of records that are equal to more than ten times that of the number of features or questions.

V. IMPLEMENTATION

In this paper, we are using different types of Machine Learning technique to predict the stress level of the students. In the questionnaires test, we understand the student's different types circumstances and situations. This proposed model includes PSS dataset collection, pre-processing, feature extraction shows the comparison on the basis of their performance parameters

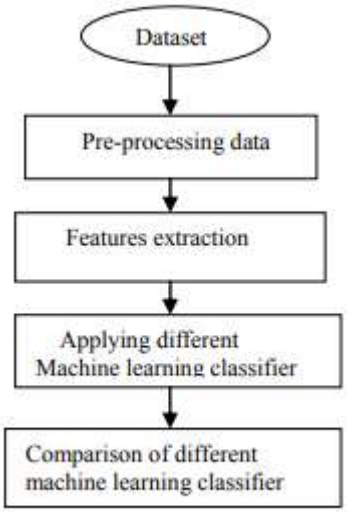

Fig-1(overall methodology)

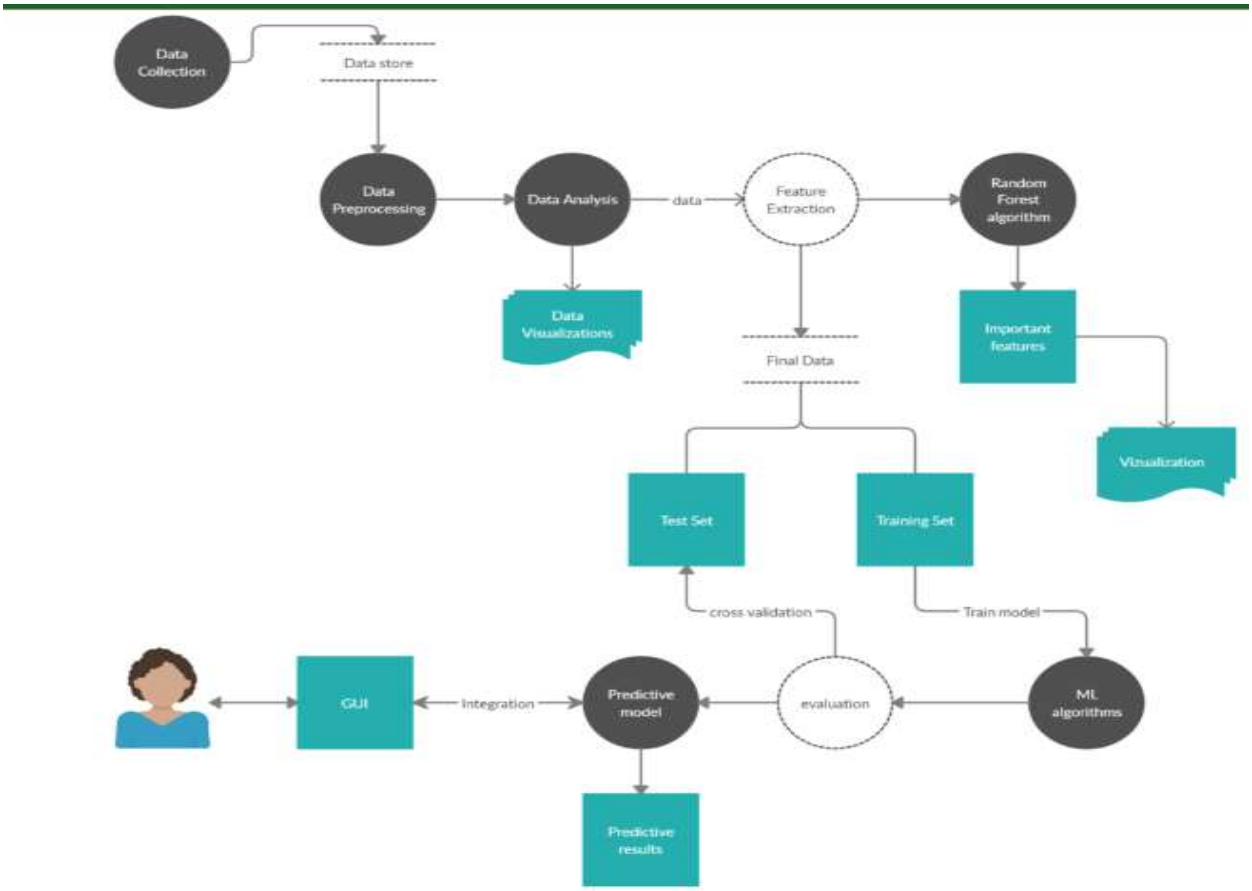

Fig 2. System Framework for the Stress Prediction model

Data Pre-Processing

The collected data had some missing fields and some outliers; hence data cleaning was done. Finally, the dataset was reduced to 197 entries. Demographic fields from the dataset were also eliminated before the application of the machine learning algorithm.

Depending on the answers to 18 questions, each answer was given a numeric value from 1 to 5 depending on whether the answer on the Likert scale reduces or increases the stress levels. For example, if the respondent says that he/she "Always" gets "Support from family", then the transformed value for Always is 1 (Low stress) and if he says he "Never" gets "Support from family", then the transformed value for "Never" is 5 (High stress). Corresponding to answers to all 18 questions, a score was calculated and it was transformed to Low stress (<1.33), medium stress (1.34 to 2.66), or a high stress (>2.66).

Exploratory Data Analysis

To get deep insight into collected data in terms of sample characteristics, observing the patterns, identifying outliers, various bar charts and heat maps were generated by using popular plotting libraries of Python as given below:

Matplotlib: Low level, provides lots of freedom.

Pandas Visualization: Easy to use interface, built on Matplotlib.

Seaborn: High-level interface, great default styles.

Bar chart for observing stress levels among participated males and females showed that the majority of both genders experienced medium-level stress. It was noticed that 56.8% of males and

48.61% of females fall in the category of medium-level stress. This is shown in Figure 2 and the corresponding data is shown in Table 1

Table 1 Categorization of males and females according to the level of stress

Stress Level	Gender	
	Male	Female
High	19(14.4%)	17(22.22%)
Medium	74(56.8%)	37(48.61%)
Low	38(28.8%)	23(29.17%)

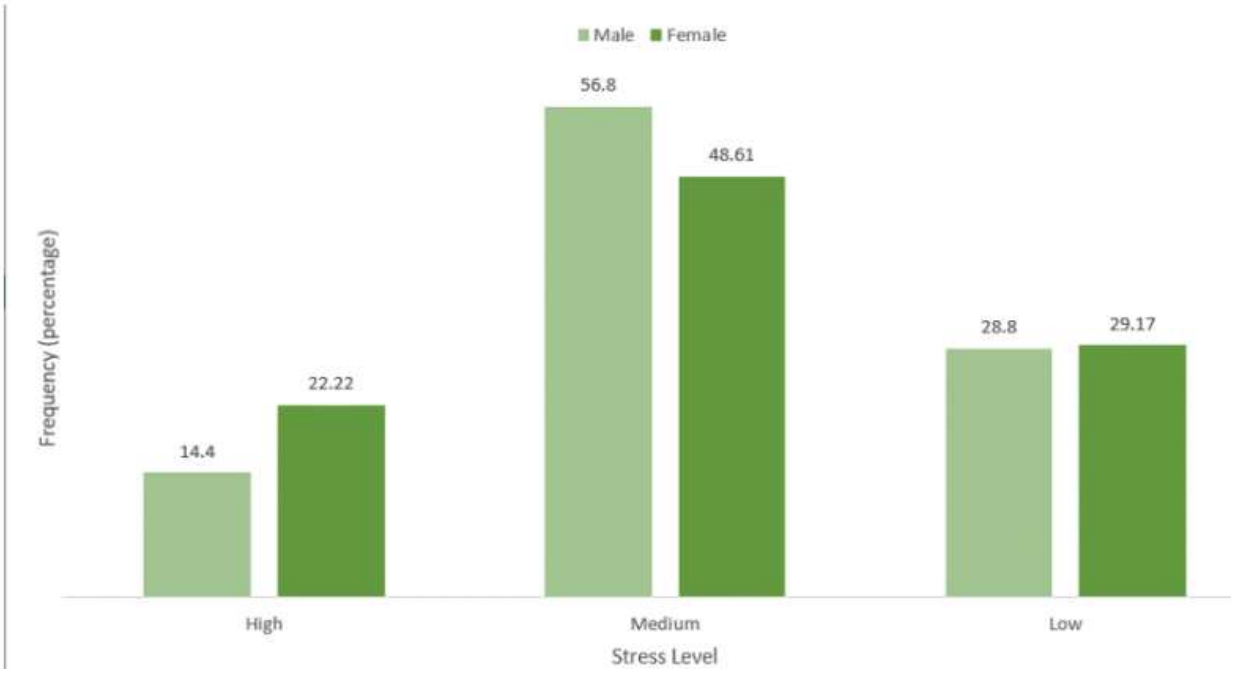

Fig 3. Percentage of male and female under three different categories of stress

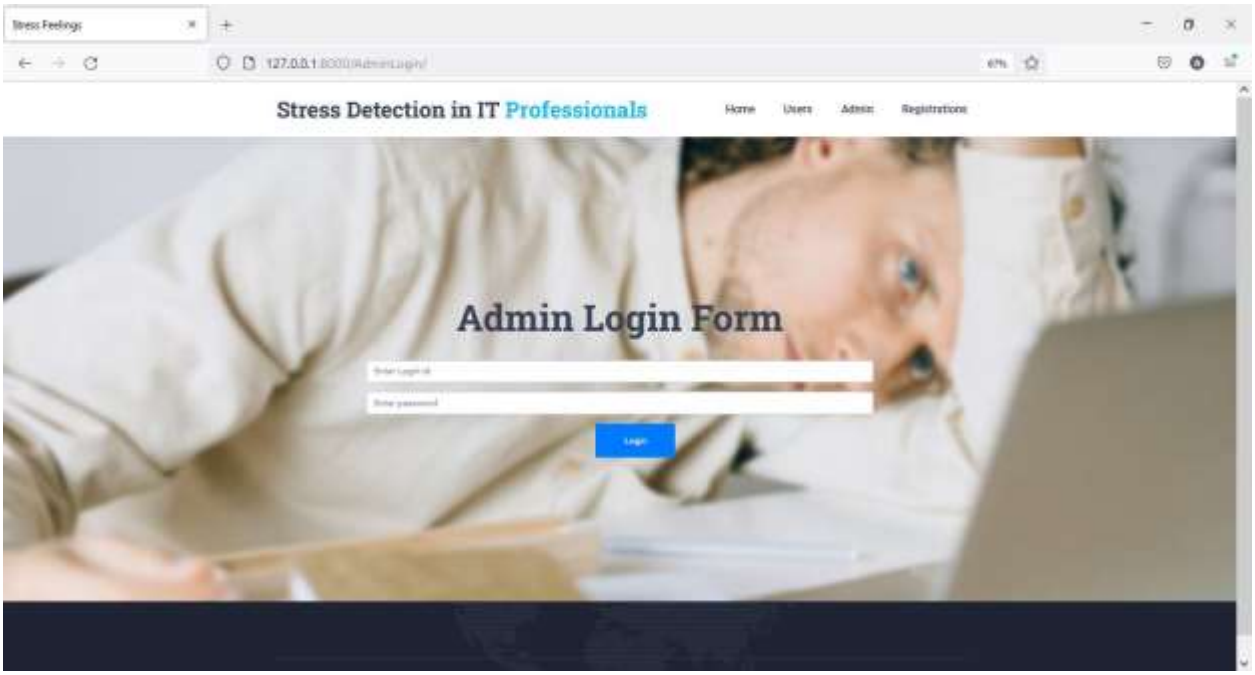

Fig 4 output 1 indicates admin login form

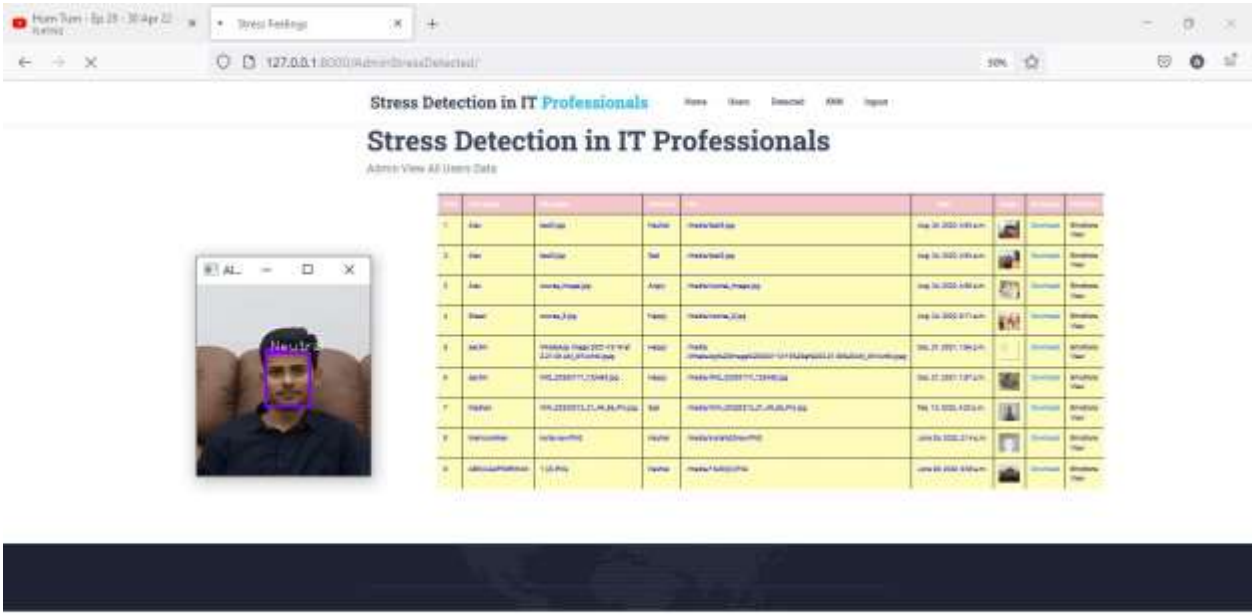

Fig 5 output 1 indicates admin details

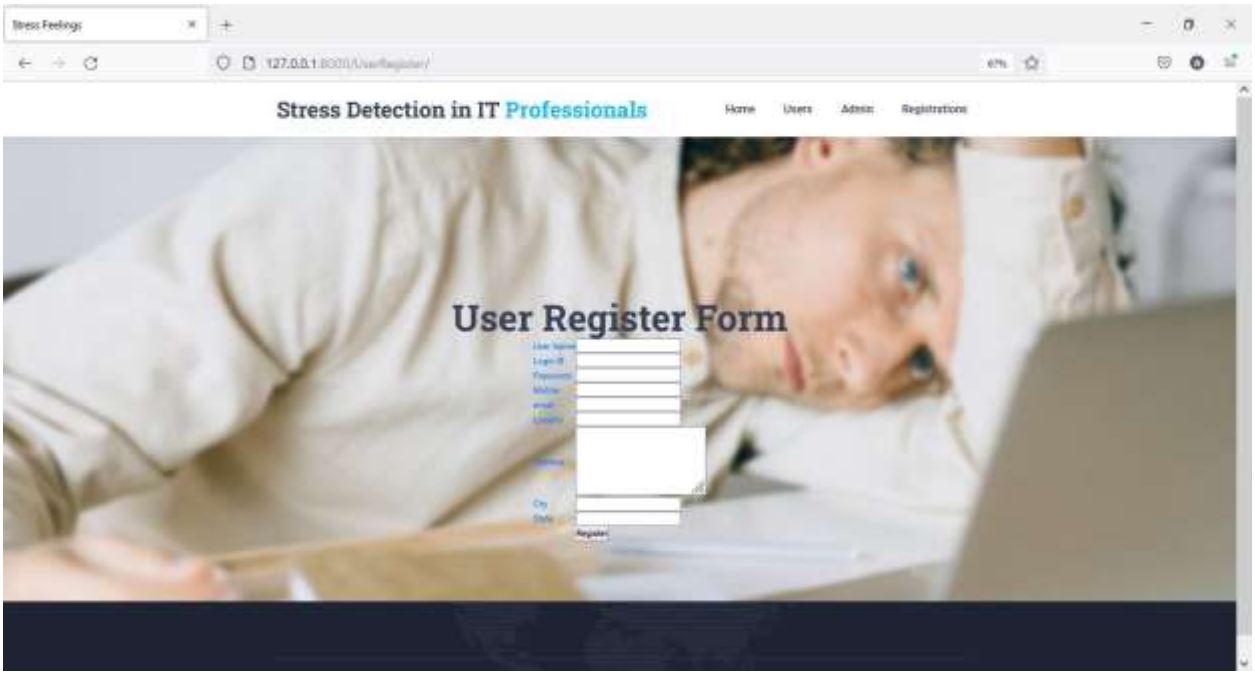

Fig 6 User registration form

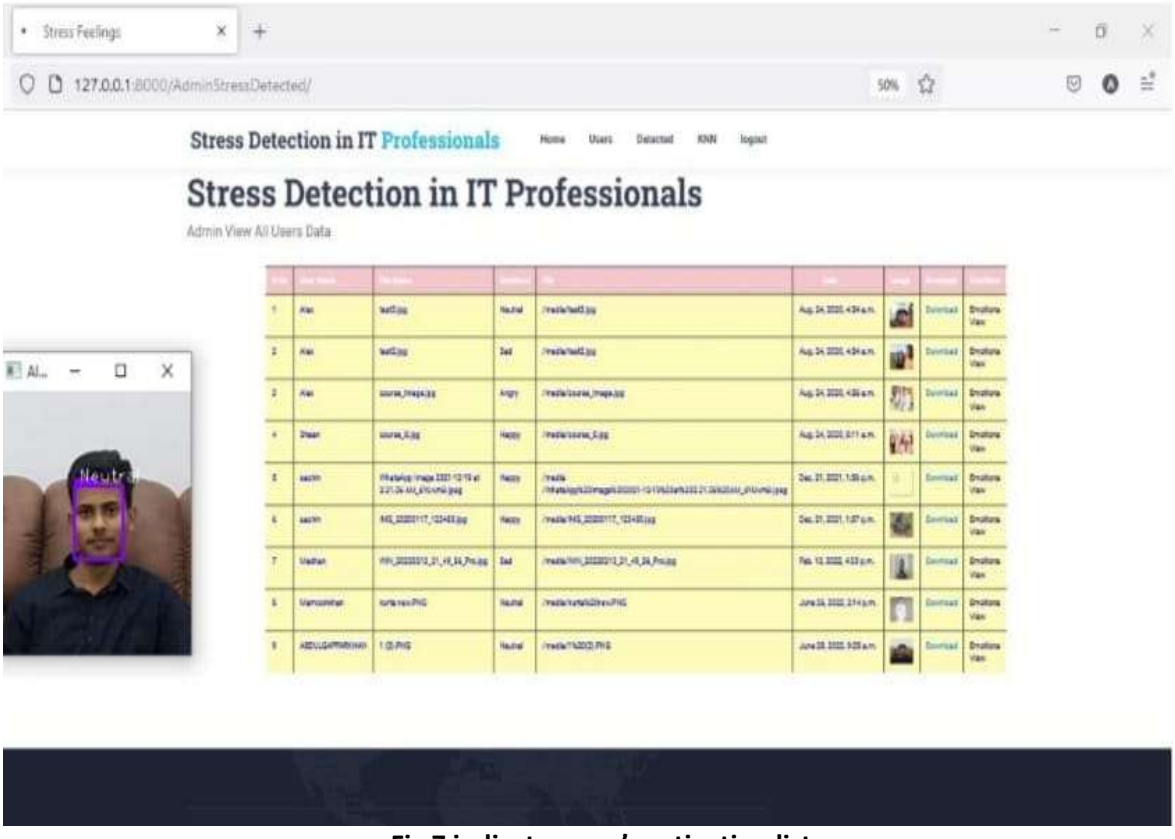

Fig 7 indicates user's activation list

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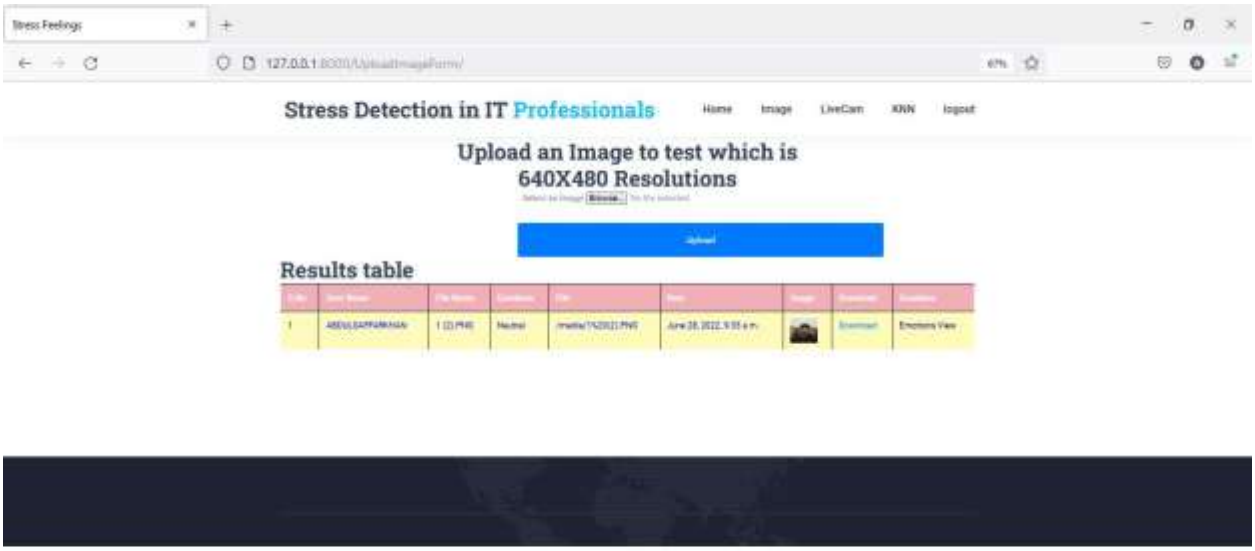

Fig 8 indicates users image uploading

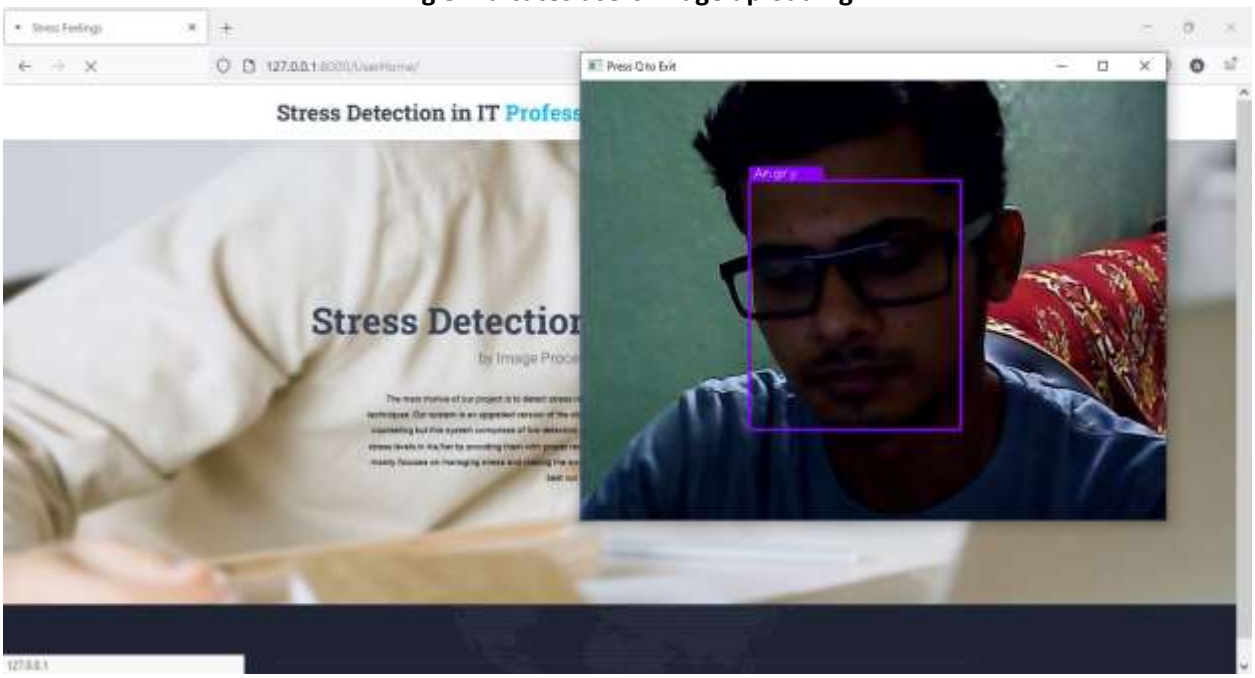

Fig 9 indicates users live activation

VI. CONCLUSION

Psychological stress is injures to health. In existing system stress is identified in face to face interview, communication or any other activities. Where two or more people are analyzed by another. In this proposed a system framework for detecting users‟ psychological stress states by using users‟ weekly social media data, leveraging tweets‟ content as well as users‟ social interactions. Here uses a words dictionary rating from -5 to +5 each word. To Classify and predict the data applied the SVM and NB algorithm. To improve result accuracy implemented the Word Sense Disambiguation by using n gram and Skip-gram model. Support Vector Machine with WSD and N gram gives

*e*ISSN1303-5150

65% precision and 67% recall. This implemented system will be helpful to detect Stress by using their daily conversations on social media data, without knowing to the user and categories the user as stressed or relaxed. In future work, smiley, like and dislike symbols can be considered for categorization of collected data, as it has major contribution to expresses feelings.

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