Predicting Employees under Stress for Pre-emptive Remediation using Machine Learning

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ABSTRACT

The modern world is filled with stress. Everyone is under pressure in a situation for one of two reasons. Aperson's pressure is affected by a variety of factors. Representatives in IT are more likely to be under pressure due to work pressure, overburdening, higher worker mastery, and so on. When a person is stressed, it can lead to a variety of mental health issues such as depression, anxiety, somatization, lack of concentration, and so on. It can sometimes be fatal. As a result, it is necessary to identify human stress at an early stage in order to provide appropriate solutions and alleviate stress. There has been a lot of research done on stress prediction. Many research papers use Machine Learning techniques to predict stress, and many papers use IOT-based sensors to extract the features needed for stress prediction. Many papers simply present the concept of stress prediction without any implementation. There are some research papers that include implementation. These implementation papers make use of ready-made tools such as the WEKA tool, the R tool, the Rapid Miner, or programming languages such as PYTHON or R. It is simple to predict stress using these ready tools and languages because they support ready libraries for stress prediction. Data science techniques are effective at processing training datasets and can predict human stress in less time and with higher accuracy.

Keywords: Data Science, Machine Learning, Stress, Information Technology Profession.

I. INTRODUCTION

The modern world is flooded with IT, and IT companies are being greeted with new extensions and requests. Representatives are bound to face pressure as a result of the changing way of life and working societies. Frameworks identify components that have a significant impact on anxiety feelings. Stress was identified in relation to orientation, family ancestry, and the availability of medical benefits in the workplace. Recognizing the pressure on representatives allows us to devise a few strategies for dealing with it and creating a much more pleasant work environment for their representatives. Several research works make use of a variety of constraints, such as preferences, age, family history, provided

medical benefits, shared information about illness, technical institution, technical job, acquiring holidays, and so on. Artificial Intelligence calculations are used in research to determine an employee's stress level. The primary goal of each of these research articles is to identify the gambling factors that influence the worker's emotional wellness.

II.   RELATED WORK

1. Title: Data Mining based Classification Algorithms for Mental Health Prediction

Authors: Aadesh Aachaliya, ViditLaijawala, Hardik Jatta, and Vijaya Pinjarkar.

Publication year: 2020

Description:The mental health of an individual reveals their emotional, psychological, and social well-being. It influences a person's thoughts, feelings, and reaction to situations. Stress, social anxiety, depression, OCD, drug addiction, problems at work, and personality disorders are a few of the factors that affect mental health issues and mental illness.

Disadvantages:

· Results are less accurate because of the use of small datasets.

· Data mining methods for predicting mental health.

· A lot of data is needed.

2. Title: Machine Learning Techniques for Stress Prediction in Working Employees

Authors: U Srinivasulu Reddy, Aditya Vivek Thota, A Dharun

Publication year: 2020

Description: In today's industry, stress disorders are a common problem for working IT professionals. Because of shifting lifestyles and workplace cultures, employees are now more likely to experience stress. In this article, we'll use machine learning techniques to examine stress patterns in working adults and highlight the factors that have the biggest effects on stress levels.

Disadvantages:

· For stress prediction, fewer parameters are used.

· The boosting algorithm is not suitable for real-time use.

· Prediction of stress using Ready Tools.

3. Predictive Analysis of Student Stress Level Using Naïve Bayesian Classification Algorithm

Authors: Monisha S, Meera R,VijaySwaminath.R, Dr.Arun Raj L

Publication year: 2020

Description: The combination of overall academic performance and social pressure has put students under pressure psychologically. In order to help students succeed academically and engage in social activities, it is important to lessen the stressors that are frequently cited. This will help people experience fewer personal health problems like migraine headaches, wearing glasses, and other issues.

Disadvantages:

· This idea only predicts the stress of college students; it is not applicable to working people.

· The algorithms here require more processing time.

· Less effective outcomes.

III.   PROPOSED SYSTEM

1. The presented system is designed for commercial use.

2. Systems identify variables that have a serious influence on stress levels.

3. Stress was discovered based on sex, family background, and the existence of medical advantages in the professional sector.

4. Understanding employee stress allows us to build policies or treatments to reduce stress levels and focus on improving the work atmosphere.

5. Gender, age, economic difficulties, family conflicts, work schedule, learning methods, medical issues, conflicts with co-workers, pressure, regularity, and communication are all major parameters considered by the system.

6. The system uses Machine learning techniques to detect stress levels.

7. The project can be implemented as a real-time business application. We chose Visual Studio and SQL

Server for application development because they are more real-time application supportive.

8. The project's primary aim is to discover risk factors that affect on the mental state of employees that work.

9. The project also makes practical suggestions to the working staff based entirely on the stress levels.

10. The project's goal is to identify causative factors and forecast future levels of employee emotional turmoil. We devise methods to reduce stress levels so that working employees' performance can be improved.
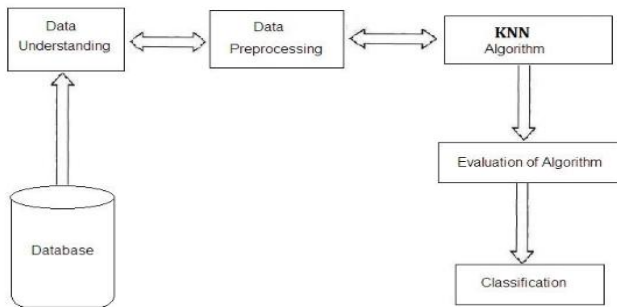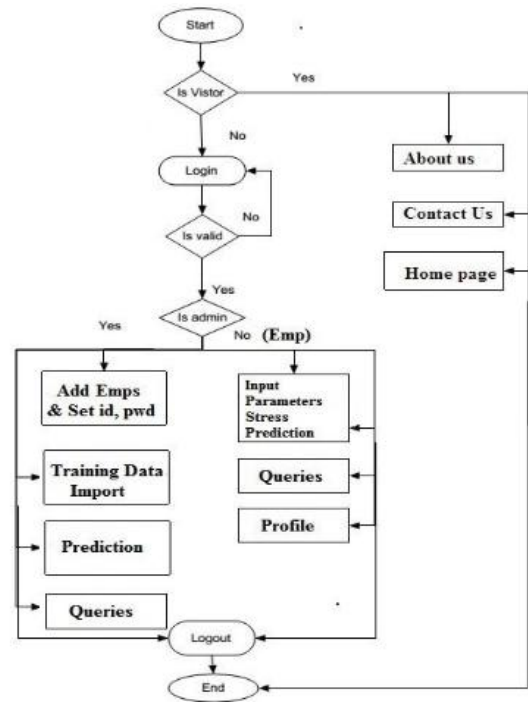

Fig 1: System Architecture

IV. RESULTS

Input: For computation, the system makes use of many parameters such as gender, age, family background, provided medical benefits, sharing about diseases, tech company, tech role, obtaining leave, and so on, as well as old data-sets.

Output: Employees are labelled as Stressed or Stress-Free dependent on their stress levels.

Fig 2: Flow Chart

V. ONCLUSION

Mental stress is a serious problem in today's society. It has been concluded that different techniques are used to detect stress. There are also several datasets available for identifying stress. Gender, family medical history of illness, and whether or not an organization provides mental health benefits to their employees were discovered to be more important than other factors in determining whether or not a person can develop mental health issues. People who work in a tech company, even if their role is not technically related, are slightly more likely to develop stress, according to our findings. These insights can be used by corporations to develop better HR policies for their employees. Moreover, ensemble methods such as boosting and KNN produced the highest classification precision and accuracy. With an accuracy of 87%, the use of Machine Learning techniques for identifying stress and mental health disorders yields significant results that can be investigated further, thereby meeting the project's goal.

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