# Sentimental Analysis for Real Time Feedback System

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*Abstract*— **In The research was conducted in order to present the student feedback system analysis model for improving the quality of teaching in academic institutions and universities. The system primarily utilizes a machine learning algorithm and textual feedback. This system has been configured to analyze student feedback in the form of comments, opinions, and reviews about teachers' performance. The textual feedback offers valuable insights into overall teaching quality and suggests valuable ways to improve teaching methodology. The purpose of this research is to look into various machine learning approaches and determine their importance. SVM, Random Forest, Nave Bayes algorithm, and lexical analysis are examples of machine learning techniques. SVM has the highest accuracy but requires more time to train for large datasets and is used for regression and classification to classify text. The collection contains data on the effectiveness of instruction and learning. This project looks at the textual comments in the text document to classify student feedback into positive, negative, and neutral categories. The system assists in reducing manual work by collecting feedback and storing it in a database accessible to authorized individuals. The teacher receives feedback analysis in the form of ratings and graphs, making data visualization easier. This system is an effective method for providing teachers with qualitative feedback that improves students' learning.**

*Keywords*— **Feedback system, SVM algorithm, Machine learning, Naive Bayes.**

## I.INTRODUCTION

This study postulates a system for student feedback that aids in assessing the effectiveness of the teacher. This student feedback system collects textual comments from students and utilizes the SVM algorithm to categorize them. Once a student logs into the portal and submits feedback, the feedback is evaluated through the analyzer. Using the support vector machine technique, feedback was then categorized into three polarities: positive, negative, and neutral. This polarity makes it easier to determine whether a performance is good, awful, or middling so that teachers can tweak their approach. The method employs subject extraction and classification to graphically represent and rate the students' opinions. This system's objective is to assist teachers in adapting their teaching strategies in light of feedback they have received. The methodology uses concept extraction and classification to graphically represent and rate the students' opinions. This system's objective is to assist teachers in adapting their teaching strategies in light of feedback they have received. The system is designed to give the college president and department head input easily and quickly (HOD). Only the feedback that would be offered in the form of ratings is visible to the teacher. The department head has the authority to view all comments being made for each instructor, lab activity, and extracurricular on the departmental level. The ability of the department head to handle extracurricular and laboratory activities in a different or better way will help to improve departmental performance as a whole. Also, the department head has the authority to hire and fire employees. Ultimately, this system will assist in enhancing the effectiveness of the college's departments and teaching techniques by gathering student input.

## II. LITERTURE SURVEY

Sentiment analysis has been the center of a thorough study. There isn't a lot of study done on text classification, which divides sentences into three categories: negative, positive, and neutral. The goal of sentiment analysis is to locate, examine, and extract opinions from texts. In paper [1] The term frequency-inverse document frequency (TF-IDF) and a domain-specific sentiment lexicon are used in this article to define a hybrid method to sentiment analysis. The drawback of this method is that it just analyzes the overall feelings of the student's comments.

In paper [2], a comprehensive study in three key areas—framework, feature extraction, and sentiment analysis—is

carried out to examine the sentiment. The methods employed in recent research are highlighted, and the present issues with those studies are discussed.

In paper [3], supervised learning techniques like support vector machines and naive bayes are regarded as common learning techniques. As compared to other classifiers, the accuracy offered by the support vector machine is good. According to this study's findings, SVM performs better with large data sets than naive bayes learning method does with small data sets.

In paper [4] offered a data mining methodology to classify the faculties of an institution into groups, ranging from 1 to 5, by taking into account specific criteria. The responses from the students were processed using text mining and naive bayes classifier. This paper's flaw was that it failed to capture students' actual sentiment.

In paper [5], This took a great deal of effort and time to process the numerous feedbacks that were gathered at the end of the semester. The model for understanding these feedbacks is revealed in this research by employing machine learning techniques including Support Vector Machine (SVM), Nave Bayes, and Maximum Entropy (ME).

In paper [6,] The sentimental analysis of Twitter data using decision trees and multinomial naive bayes algorithms is described. Findings showed that utilizing the parameters accuracy, recall, precision, and F1-Score, the decision tree method performs better.

In paper [7], a simple Bayesian technique was employed to classify texts and documents. 1150 papers were taken into account for the categorization, and the n-gram approach was employed to extract the features. Performance was assessed by taking into account factors including recollection, measure, precision, and accuracy.

In paper [8], The challenge of characterizing sentiment polarity is resolved Amazon product reviews found online are used as research for the suggested task. It was suggested to use a process for evaluating sentiment polarity. To estimate the outcome, categorization at the sentence and review levels was done.

## III. EXISTING SYSTEMS

In the current system, it is challenging, time-consuming, and requires paperwork for students to provide feedback using the manual system. To solve this issue, Google Form feedback is now provided to students in place of educational institutions, and they are expected to do so via the provided URL and a Google Form. The process is made simple and time and paper work are saved by collecting the responses using a google form. The replies gathered from the students are saved in Google Forms as a.csv file.

## IV. PROPOSED SYSTEMS

A website would be used to collect student feedback in the proposed system, and ML algorithms would be used to evaluate questions created using the academic resources made available to students. The input is then divided into three categories: satisfactory, neutral, and negative. The goal of this system is to gather student feedback and use machine learning methods to analyze it. To achieve the goal of student feedback, we need methodologies like machine learningbased approaches in addition to other approaches like data analysis and model construction. The technique facilitates graph visualization of feedback data output..

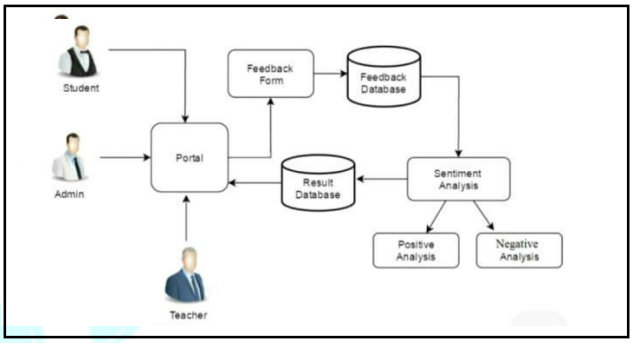


**Figure1.System Architecture**

Benefits of the proposed system include:

- ✓ Significantly lowers time and effort.
- ✓ Reduces paperwork Attractive user interface
- ✓ Improves security Report generation is simplified and efficient.

## V.METHODOLOGY & RESULTS

**1**. The website feedback from students is an input source of information. I.e., training data that will be used to train the system. When test samples are received, the trained system. When a test sample is received, the trained system uses machine learning algorithms to categorize the text into positive, neutral, and negative categories. This outcome is represented graphically. The suggested methodology consists of six steps: gathering student comments, preparing training data, feature extraction, training the model, analyzing test outcomes, and graphical representation.

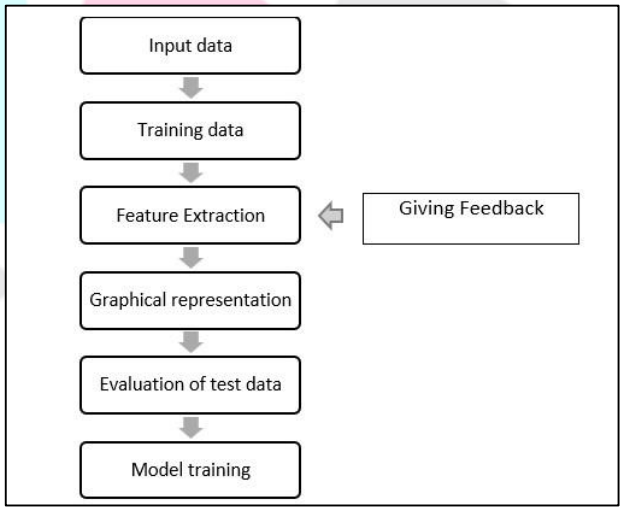


**Figure 2: Methodology**

**2. FEATURE EXTRACTION**

Machine learning algorithms are used in this feature extraction from datasets that include formats like text. The feature extraction process is applied to both train and test data. by use the sci kit-learn toolkit, which includes tools for tokenizing and stemming textual data. These text documents can be tokenized, and Count Vectorizer, Tf-idf Vectorizer, Snowball Stemmer, and SGD Classifier are used to build a vocabulary of recognized terms. These feature tools are employed in the extraction of data features.

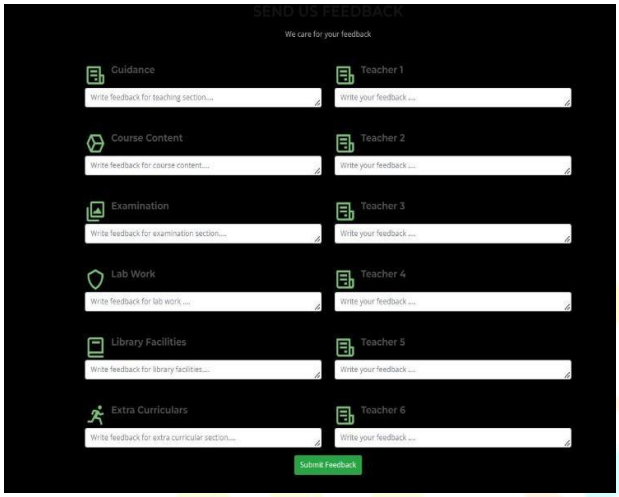


**Figure 3: feedback form**

## 3. MODEL TRAINING

There are several different machine learning text classification algorithms.

A) Multinomial Naive Bayes Classifier (MNBC)

This MNBC is a well-liked machine learning technique addressing issues with text classification in NLP (NLP)

It is especially helpful for issues involving discrete text data features, like word frequency counts.

B) Support vector machine (SVM) classifier algorithm. Support vector machines analyze data, specify decision boundaries, and use kernels for computations that take place in input space.

The two sets of vector input data are categorized into different classes.

Finding a space between the two classes that is remote from the document is the current task.

The classifier's margin is determined by the distance, and increasing the margin helps to cut down on incorrect judgments. SVM method also provides regression and classification. They improve in statistical learning and support in highlighting the aspects that contribute to better

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MultinomialNB classifier has accuracy of 86.08762490392006 %
SVM classifier has accuracy of 90.00768639508071 %
MultinomialNB stemmed classifier has accuracy of 75.78785549577248 %
SVM stemmed classifier has accuracy of 82.85933897002306 %

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knowledge.

SVM takes the following actions:

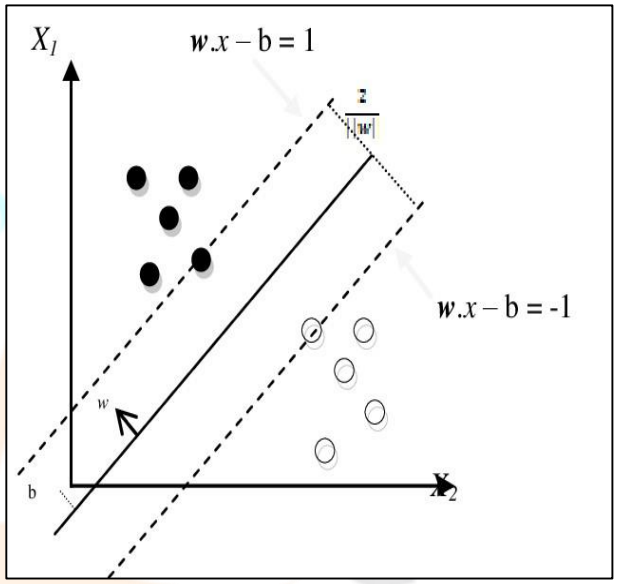
SVM takes the following actions:

- Investigate the information to determine how they appear. Pre-process the information.
- Separate the data into labels and attributes.

Create training and testing sets from the data.

- Practice with the SVM method.
- Create a few forecasts.
- Assess the algorithm's output.

**Figure 4: SVM Classifier**




The top dataset points of the hyperplane are classed as positive and the given score is 1 in the SVM model discussed above. lower dataset points are marked as "negative classifiers," and they will be given a score of "-1."

## 4. EVALUATION OF TEST DATA

Data collection and analysis are steps in the evaluation process, and the outcome can be used to judge whether the model is operating well or not. The training portion of this *process has been finished. The challenging final step will* yield the model's best accuracy. It will be used in testing. After determining the model's accuracy, we can select the most efficient algorithm and modify it for the model's training and testing.

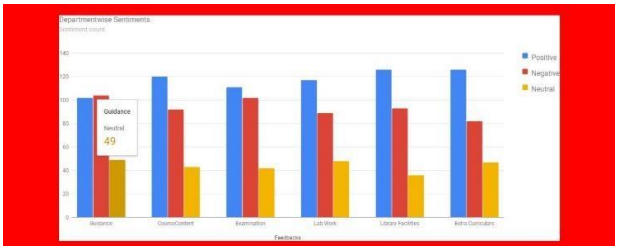



**Figure 5: Model accuracy**

## 5. GRAPHICAL REPRESENTATION

Data visualization is the presentation of data in graphical format.HTML and CSS have many features that provides graphical interfaces. It is the representation of data using common graphics such as charts, plots, infographics, and even animations. These information visualisations communicate complex data relationships and data-driven insights in an understandable manner.


**Figure 6: Home page**

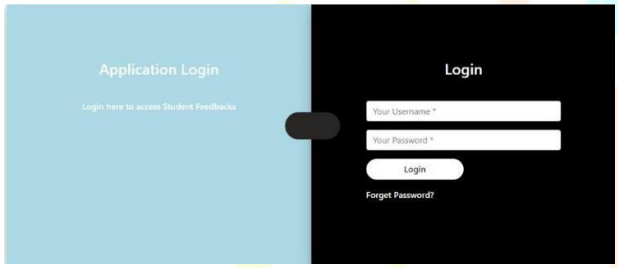



**Figure 7: Login page**


**Figure 8: Feedback classification**

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**Figure 9: Bar chart**

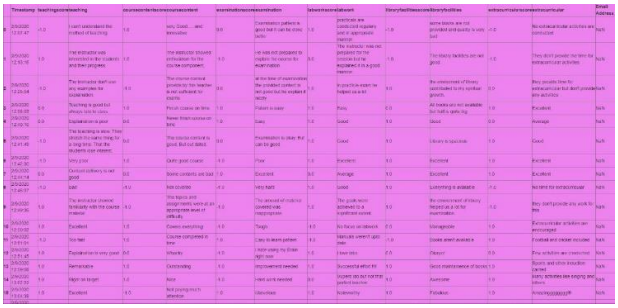

**Figure 10: Data-set**

## V.CONCLUSION

In this paper, we did research using the SVM classifier to classify the text on sentimental analysis collected from students. The project "student feedback system" is designed in order reduce the burden of maintaining bulk of records of all the student feedback details of who study in an education institution .Inserting , retrieving & updating the feedback details of student are easy when it is compared to the manual feedback & storing maintaining the project is also easy which can is easily understandable. Maintaining the details in the database is manageable.

## VI. FUTURE SCOPE

This student feedback system has been designed in such a way that the user's future needs are satisfied. Users' requirements will be addressed in the future. In the future, there may be an option to modify the question and import new student names and teachers via the portal. It is also intended to install the software and expand its functionality on mobile platforms for operating systems such as Windows, Android, and iOS.

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